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KEY TO ABBREVIATIONS

B R — Book Review	Misc — Miscellaneous
C — Correspondence	N — Notice
C. R. — Case Record	N E S S — New England Surgical Society
E. — Editorial	N E U A — New England Branch of the American Urological Association
M M S — Massachusetts Medical Society	N H M S — New Hampshire Medical Society
M L S — Massachusetts Medico-Legal Society	O — Obituary
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HEMOLYTIC STREPTOCOCCAL INFECTIONS WITH SPECIAL REFERENCE TO PROGNOSIS AND TREATMENT WITH SULFANILAMIDE

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BOSTON

IN EVALUATING the therapeutic effectiveness of any method of treatment of an infectious disease, two procedures can be used. First, it can be determined whether the treatment reduces the fatality rate in a large number of cases; secondly, it is often possible to decide whether the course of the disease can be shortened or altered and certain of its features prevented. In evaluating data, it is necessary to consider all the factors which influence the fatality rate, particularly the patient's age. It is sometimes exceedingly difficult to decide whether the course of an infectious disease has been changed by treatment. In diseases that are self-limited in their course, this is much easier than in those diseases in which the course is indeterminate. For example, it is well known that uncomplicated scarlet fever or erysipelas may have a course of from seven to ten days of fever, when recovery rapidly takes place. In puerperal sepsis, mastoiditis or cellulitis the duration of the condition may vary widely, so that it is impossible to predict how long the infection will persist under conditions which do not call for surgical or other types of treatment.

In order to obtain more information concerning the relative importance of various factors in the case fatality rate of hemolytic streptococcal infections, I have summarized certain important features, including age, type and location of the lesion, the presence or absence of bacteremia or debilitating disease, and the type of treatment.

It is now commonly recognized that the mortality in hemolytic streptococcal infections is highest in the first, third and seventh decades. This corresponds respectively to the peaks of incidence of infections occurring in the throat, of puerperal infections and of infections such as cellulitis and

erysipelas. In the first decade, the highest incidence of death is seen in infants and children under four, especially when there is erysipelas or middle-ear and mastoid disease with its intracranial and other complications. In the cases of puerperal infection, the death rate is highest in those with peritonitis, with thrombophlebitis and with bacteremia. With erysipelas the seriousness of the

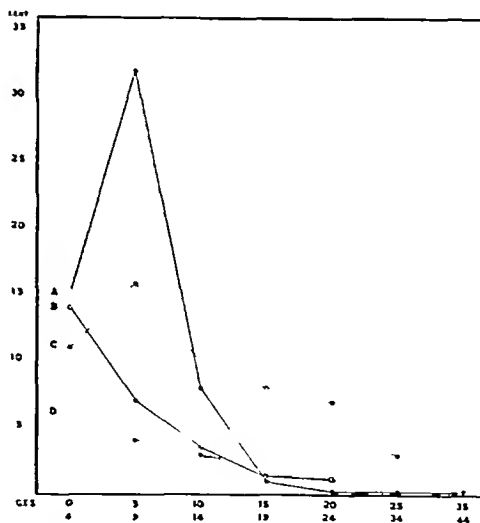


Figure 1

A Percentage distribution according to age of 200 000 cases of scarlet fever in Massachusetts

B Mortality rate of scarlet fever per 100 000 population at various ages

C Percentage of cases of hemolytic streptococcal bacteremia arising from throat infections

D Percentage of fatal cases from Group C

infection increases with age. In general, it may be said that streptococcal infections are most serious at the two extremes of life—in the very young and in the aged. The location of the infection at various ages, however, plays a significant part and must be taken into account.

Read before the combined clinical meeting at the annual meeting of the Massachusetts Medical Society, Boston, June 2, 1937.

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Infections of the Throat and their Septic Complications Figure 1 illustrates the incidence of these infections at various age periods and the mortality per 100,000 population. It also shows the age distribution of bacteremia and its case fatality. The facts to be gathered from Figure 1 are as follows: The highest fatality rate is under four years of age, this despite the fact that the age of highest incidence of hemolytic streptococcal infection is between five and fifteen. The form of the curve for bacteremia resembles the curve of incidence of the diseases, but the fatality rate is less in patients over four years than in those under four. The infection is also much more serious when there are complicating conditions such as acute mastoiditis and lateral sinus thrombosis.

Erysipelas and Cellulitis The fatality rate in erysipelas is about 15 per cent. This varies, however, with age, as shown in Figure 2. It is highest

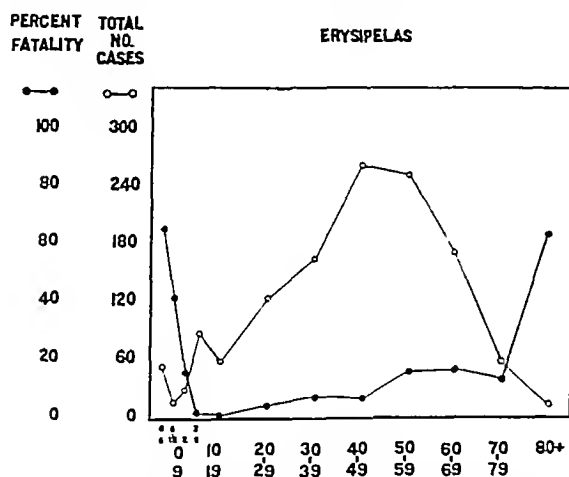


Figure 2. Age distribution and case fatality rate in 1400 cases of erysipelas. The small numbers in the first decade indicate months and years, that is, 0-6 and 6-12 represent months, 12 and 3-9, years.

under six months and lowest from ten to fifty years. After fifty it rises with advancing age, so that it almost reaches its former level. This is due in part to its occurrence in patients with debilitating diseases. Approximately 70 to 90 per cent of individuals with bacteremia and erysipelas die.

Puerperal Sepsis The fatality rate in hemolytic streptococcal puerperal sepsis varies among different clinics from 15 to 30 per cent. When the blood cultures are positive, the rate is about 50 per cent, when they are negative, about 20 per cent. In most of the latter cases death results from peritonitis or thrombophlebitis. It would appear, then, that the most favorable cases are those with a negative blood culture and no signs of peritonitis or pelvic phlebitis, and that the most unfavorable cases are those with bacteremia with or without

peritonitis or thrombophlebitis. Of the cases with bacteremia, the favorable ones are those in which the blood stream can be cleared with or without the subsequent development of a localized abscess.

Bacteremia A recent survey of 246 cases of hemolytic streptococcal bacteremia¹ showed that bacteremia is always of grave prognostic significance, the fatality rate was 72 per cent. There was a tendency for bacteremia to increase in seriousness with advancing age, and whenever it occurred during the course of erysipelas or cellulitis the fatality rate was high. It was somewhat lower in puerperal sepsis, and lowest of all in the first two decades of life and when the primary infection was situated in the throat, middle ear or mastoid processes. A summary of the fatality rates with different primary infections is given in Table 1.

Table 1. Summary of Total Number of Cases with Bacteremia and Infection in Various Locations.

PRIMARY INFECTIONS	TOTAL NUMBER OF CASES	TOTAL NUMBER OF FATAL CASES	PER CENT DEATHS
Throat, middle ear and mastoid in fections including lateral sinus cavernous sinus and tonsillar vein thrombosis	69	38	55
Pelvic infections	41	23	56
Cellulitis and erysipelas	61	49	80

When recovery follows a demonstrable hemolytic streptococcal bacteremia it can be shown that the blood is invaded for a relatively short period and is then cleared of organisms, with or without the subsequent development of focal metastases in various organs. Where such metastases can be adequately treated by surgical methods, recovery usually takes place. When death occurs there has usually been (1) a rapidly progressive bacteremia without focal metastases, (2) focal metastases in areas such as the endocardium or meninges, or (3) multiple abscesses which cannot be treated by surgical methods.

We have been able to correlate the above findings with the immune reactions of the patient, as follows. In rapidly advancing bacteremia, no antibodies can be found in the circulating blood by the methods that we have used. When the blood is cleared of organisms, antibodies can be demonstrated, and in the cases with focal metastases and secondary waves of bacteremia they can be found in the circulating blood. It may be assumed, then, that bacteremia indicates a loss of equilibrium between the normal clearing mechanism for bacteria and the local defense mechanism.

The prognosis in hemolytic streptococcal infection evidently depends on the summation of such factors as age, location of infection, bacteremia, the presence of focal metastases that can be treated adequately, and debilitating diseases.

The method of treatment depends upon whether the manifestations of the infection are toxic or septic. The former are best illustrated by scarlet fever, in which it is now agreed that the rash, the febrile reaction (in part) the associated symptoms of infection, the enanthem and the faucial edema are caused by the exotoxins (erythrogenic toxins of the organism), it is also well recognized that these symptoms can be effectively treated by the use of scarlet fever antitoxin or potent convalescent serum. When patients are treated early and with adequate amounts of antitoxic serum, there is a fall of the temperature, frequently by crisis, six to twelve hours after its administration, a fading of the rash, a rapid disappearance of many of the symptoms of the infection, and a diminution of the faucial edema. In many cases the manifestations, both local and general, disappear in four or five days. No one who has witnessed these results can doubt the efficacy of this type of treatment. Nevertheless physicians often hesitate to use antitoxic serum. Their reasons are that the disease is frequently so mild that the serum is unnecessary, that the sickness which follows its administration is frequently severe and uncomfortable, and that general agreement that it prevents septic complications is lacking. Of these objections, the last is the most important. There is a fair amount of testimony that in certain clinics at least, the complications are fewer in the serum-treated cases than in the untreated ones, and while it will be generally admitted that these complications cannot be abolished, the evidence is sufficiently convincing to encourage one to use serum more freely in this disease. This is especially true for cases in the age period when the disease is likely to be most serious, namely, when the patient is less than five years of age, and where, regardless of age, there is a sharp febrile reaction with a faucial edema. To avoid serum sickness and horse serum sensitivity, convalescent serum may be used.

The ultimate goal in the treatment of septic features is to localize the infection, suppress the growth of organisms and finally destroy them. Our information concerning all the factors that favor such localization and destruction is woefully incomplete, but there are excellent grounds for believing that both a local and a general defense mechanism are brought into play. We know, for example, that focalization of an infection generally indicates an efficient local defense mechanism, and this, in turn, is dependent in large part upon the development of specific immune bodies. This can be amply demonstrated in many infections, that is, an infection can frequently be prevented from spreading and the blood stream cleared of organisms by the use of specific antibacterial

serum. When focalization occurs spontaneously and the blood stream is cleared, bacterial antibodies are usually demonstrable.

There are no type-specific antibacterial serums available for general use in hemolytic streptococcal infections. The use of antibacterial hemolytic streptococcal serum has been unsatisfactory because it lacks specific antibodies. To meet this deficiency, Lyons² has urged the use of immune blood transfusions from donors who possess antibodies against the particular strain of infecting organism. This method is sound, and is undoubtedly of great benefit for patients with bacteremia. Its only disadvantage is the time required in finding a suitable donor, in addition, technic for this is such that it requires someone with considerable experience to carry out the tests.

Other methods that have been used in the treatment of these infections are those of chemotherapy. The most recent one which gives promise is the use of sulfanilamide. The historical development of this drug is described in excellent summaries by Colebrook and Kenny^{4, 5} and Long and Bliss⁶.

It is well to review briefly the facts that are known about this drug as regards hemolytic streptococcal infections. It has been shown that it is not bactericidal when added to ordinary culture media, it is, however, bacteriostatic. When it is added to whole blood of men or monkeys, blood bactericidal power is increased, the same result can be accomplished in human beings by the oral administration of the drug.³ I have been unable to increase the bactericidal action of human serum by adding sulfanilamide but have effected it in some cases by adding it to whole blood.

The drug will save and prolong the lives of mice infected with many lethal doses of hemolytic streptococci, when the drug is withheld the animals die. Insofar as man is concerned, the most convincing evidence of its beneficial action rests in the 5 cases of hemolytic streptococcal meningitis^{7, 8, 9} in which the patients have recovered following its use, and there is strong evidence that it is beneficial in puerperal infections with and without bacteremia.^{4, 5}

I now present the results of my own experience with this drug in the treatment of 9 cases of hemolytic streptococcal infection with bacteremia, and of 8 cases of localized infection without bacteremia. This number of cases is too small for statistical analysis, but it indicates the trend of results.

The cases with bacteremia are summarized in Table 2, Figures 3 and 4 illustrate the clinical course of 2 patients with the disease who recovered. Figure 5 illustrates the course of 1 fatal case. The fever persisted in these cases from three to eighteen days after the drug was first given. The total amount administered varied from 18 to 58 gm.

ulating blood of man, Marshall has found that it is necessary to give approximately 0.066 gm per kilogram of body weight. After a single large dose has been given by mouth, the drug reaches

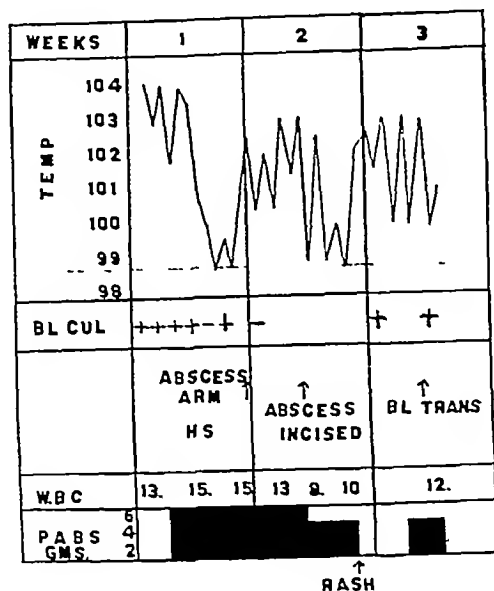


Figure 5 Temperature chart and course of disease of patient (Case 7) with thrombophlebitis of the right internal jugular vein with a submaxillary abscess and bacteremia with subcutaneous abscess. Abscess contained both *Staphylococcus aureus* and hemolytic streptococci at necropsy. White blood-cell count is recorded in thousands.

its maximum concentration in the blood within three to five hours, unless it is continued at regular intervals this concentration rapidly falls, because of its excretion in the urine. In order to maintain the concentration at a level of approxi-

Table 3 Summary of Local Hemolytic Streptococcal Infections without Bacteremia Successfully Treated with Sulfanilamide

CASE NO	AGE AND SEX	TYPE OF INFECTION	DURATION OF FEVER BEFORE TREATMENT	DURATION OF FEVER AFTER TREATMENT	TOTAL DURATION OF DIS-EASE	AMOUNT OF DRUG
			days	days	days	gm
1	25 F	Puerperal sepsis	0	8	8	44
2	26 F		1	4	5	32
3	28 F		1	2	3	24
4	29 F		14	2	16	160 cc prontosil
5	26 F		2	2	4	20
6	23 F		6	5	11	12
7	30 F		0	4	4	20
8	56 M	Cellulitis	1	3	4	24

mately 10 mg per cent, it is necessary to continue administration at four-hour intervals. For these reasons, we have given the drug in accordance with the following plan. An initial dose of 0.6 gm per kilogram was given immediately, and this was followed by 0.6 gm every four hours until the temperature became normal. The drug was continued for an additional three or four days. In

many of our patients, therefore, 4 gm was given immediately, and an additional 4 gm during the next twenty-four hours and on each succeeding day. With each dose of sulfanilamide, 1 gm of sodium bicarbonate was added to prevent the excessive loss of base in the urine.

Marshall, Emerson and Cutting¹⁰ have studied the toxicity of the drug in animals, and in general they have found that it is relatively nontoxic. Certain symptoms due to it have been noted, such as malaise, headache, weakness and loss of energy. Anorexia and nausea with occasional vomiting also occur. Cyanosis of the skin and mucous membranes is observed in practically all cases when large doses are given, and unless sodium bicarbonate is administered coincidentally mild acidosis follows. Skin eruptions occasionally appear after several days, and they have the characteristics of a

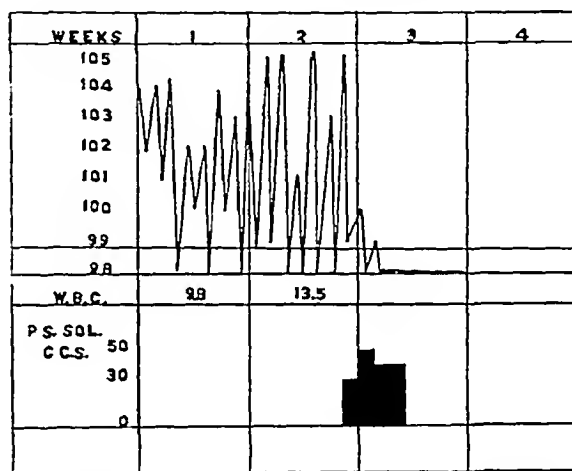


Figure 6 Puerperal sepsis without bacteremia (Case 4). Temperature returned to normal two days following the beginning of treatment with prontosil solution.

pleomorphic maculopapular eruption of a morbilliform character. Fever also may be associated with the skin lesion.

A few cases of acute hemolytic anemia with hyperleukocytosis, jaundice, hepatomegaly and splenomegaly have been reported. All these patients recovered promptly following blood transfusion.

The drug being eliminated in the urine, it is well to limit its amount in patients with renal insufficiency, since in such cases it accumulates in the blood and tissues. Furthermore, since it contains the benzene ring, it is wise to do repeated leukocyte counts to detect any signs of agranulocytosis.

SUMMARY

1. The prognosis in hemolytic streptococcal infection depends on the summation of such factors as the age of the patient, the location and extent of the local lesion, the presence of debilitating dis-

eases, and the presence or absence of bacteremia. The type of treatment and the availability of the local lesion for surgical treatment are also highly important.

2 The highest fatality rate is observed in patients under five or over fifty.

3 Puerperal infections and cellulitis are usually more serious than infections arising in the throat.

4 The presence of such debilitating diseases as arteriosclerotic occlusion of the blood vessels of the extremities, diabetes, tuberculosis, cirrhosis of the liver and chronic nephritis always increases the mortality rate.

5 When bacteremia is present, the fatality rate is in the neighborhood of 70 per cent. It is highest in patients with cellulitis and erysipelas, slightly lower in puerperal sepsis, and lowest in infections arising in the throat, middle ear, and mastoid processes during the first two decades.

6 Treatment with antitoxin is most effective in young patients who have scarlet fever associated with high fever, faucial edema and the signs of profound intoxication.

7 Immune blood transfusions are helpful in infections with bacteremia where there is no sign of a localizing process.

8 Sulfanilamide is effective in delaying the death of mice infected with many lethal doses of hemolytic streptococci. Insofar as the infections

in man are concerned, the most suggestive evidence that this drug has a beneficial effect are the cases of hemolytic streptococcal meningitis which have recovered following its use, and the cases of hemolytic streptococcal bacteremia which it has favorably influenced. A more precise definition of its field of usefulness must wait upon a longer experience.

The sulfanilamide used in these cases was supplied by Winthrop Chemical Company and by Merck and Company, Inc. The prontosil solution was supplied by Winthrop Chemical Company.

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ENCEPHALOGRAPHY IN THE DIAGNOSIS OF SUBDURAL HEMATOMAS

An Analysis of 35 Cases

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DIAGNOSIS and treatment of subdural hematomas are becoming increasingly important problems in this age of alcohol, automobiles and accident insurance. One¹ of us in a recent article on this subject stated that in his experience "the diagnosis of subdural hemorrhage can be made only by exploration." He also noted that "encephalography and ventriculography have both been successfully used as diagnostic measures." Horrax and Poppen,² speaking of the chronic variety, say that "if there is any real question of a subdural hematoma, an encephalogram may be performed instead of the taps."

The term "subdural hematoma" embraces acute and chronic forms, the now antiquated pachy-

meningitis hemorrhagica and that vague entity, hydrops of the subdural space. It is now generally accepted that the pathologic picture of chronic subdural hematoma is but a late variant of the acute phase, and that at the late stage the hematoma may be liquid or solid or both, depending upon the osmotic interrelations that have been formed.¹

LITERATURE

Very little reliable evidence has been presented concerning the encephalographic diagnosis of subdural hematomas, this little is of no practical value because of its rarity. Many reports concerning the encephalographic picture after cranial trauma have appeared. Several of these contain pictures and case records suggesting that subdural hematomas were present but unrecognized by the authors.^{3-5, 6-8} None, however, are conclusive.

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Single cases of large calcified subdural hematomas have been reported by Goldhahn⁹ and by Critchley and Meadows¹⁰. In the former case, encephalography showed a large, single, calcified cyst compressing the homolateral ventricle and displacing it to the opposite side. In the latter, the mass was demonstrated roentgenographically without air injection. Both were proved by pathological examination.

Wartenberg¹¹ in 1926 successfully utilized encephalography in the differential diagnosis between subdural hematoma and cerebral neoplasm, the hematoma being confirmed at necropsy. Jochims¹² reported a case diagnosed by suboccipital insufflation of air. Dickerson¹³ reported another diagnosed by encephalography and confirmed at operation. Lindemulder¹⁴ reported still another in which encephalography was successful after ventriculography had failed. Grant¹⁵ described a chronic subdural hematoma as one of thirty-one verified brain tumors demonstrated by encephalography. Balado and Morea¹⁶ published 4 cases in which encephalography demonstrated subdural hematomas. In 3 of these intraventricular lipiodol was used as well as air.

Dyke¹⁷ has recently described a rare but pathognomonic encephalographic sign of subdural hematoma. This is a fingerlike subdural air shadow which lies over the hemisphere. He says that a similar but undiagnosed picture appeared once before in the literature. Even if pathognomonic, such a sign is found too infrequently to be of practical value.

All the above reports concern encephalographic demonstration of large solid chronic subdural hematomas which had produced gross alterations of the ventricular system.

Holt and Pearson¹⁸ have presented 3 cases in which an encephalographic picture of bilateral subdural air was associated with bilateral subdural fluid hematomas found later at operation. They believe that bilateral subdural air is suggestive of the condition. They consider this diagnosis even more probable when subdural air is associated with small ventricles, and feel that it is pathognomonic when a subdural cyst is outlined. On the other hand, Lemere and Barnacle¹⁹ have demonstrated subdural air in 20 per cent of 800 encephalograms (12 per cent bilateral, 6 per cent unilateral, 2 per cent subtentorial). If Holt and Pearson are correct, their conclusions would suggest that in an improbably large percentage of the 632 psychopathic cases reported by Lemere and Barnacle the patients were suffering from chronic subdural hematomas. Allen and associates²⁰ found subdural hematomas in only 7.9 per cent of 3100 consecutive autopsies on psychotic patients. It is

likely, therefore, that subdural air may appear in many cases in which there are no hematomas.

METHODS AND MATERIALS

Air injections were performed in all cases as a diagnostic aid. Three ventriculograms and thirty-two encephalograms were performed on 35 patients. The great majority of the encephalograms were done by the automatic simultaneous replacement method.²¹ Air was used in all cases. Except three x-rays not taken in this clinic, all roentgenography was performed with the patient sitting erect throughout the procedure. Encephalographic diagnoses were made first without reference to the case history and were later rechecked with respect to the clinical findings. Removal of the hematomas was accomplished according to the technique described by Munro.¹

Major preoperative diagnoses were as follows: subdural hematoma suspect 18, posttraumatic syndrome 12, posttraumatic epilepsy 11, brain tumor suspect 8, hysteria 4, focal or Jacksonian epilepsy 3.

RESULTS

Twenty-two patients were operated upon and discharged later with the following diagnoses: chronic subdural hematoma 7, chronic fluid subdural hematoma 9, extradural hematoma 1, subdural hematoma (?) 2, subpial cysts 1, posttraumatic syndrome 2.

In this group nineteen encephalograms were successfully performed and three ventriculograms were attempted. Two of the three ventriculograms were unsuccessful. The results are summarized in Table 1. It will be seen that 13 out of 22 cases

Table 1 *The Diagnostic Value of Encephalography and Ventriculography in 22 Patients Explored for Subdural Hematomas*

STATUS	SOLID SUBD HEM	FLUID SUBD HEM	TOTALS
Correctly demonstrated	5	1	6
Correctly suggested	2	3	5
Correctly excluded	1	1	2
Not present when diagnosed	1	1	2
Not shown when present	0	5	5
Inadequate x rays	1	1	2
Total	10	12	22

(60 per cent) were correctly diagnosed, 7 (30 per cent) incorrectly diagnosed, and 2 (10 per cent) undiagnosed because of inadequate ventriculography. A separate analysis of the solid and fluid hematomas is much more significant, however. Eight out of 10 cases (80 per cent) with the solid type were correctly diagnosed, 5 being definitely demonstrated in the films. On the other hand, only 4 out of 12 (33 per cent) with fluid hematomas were correctly diagnosed, and in 5 others the films failed to show fluid which was subsequently demonstrated

at operation. There were, however, only 2 cases in the series in which operation failed to reveal a hematoma when encephalography had suggested its presence. These observations suggest that encephalography may be of value in demonstrating and localizing solid subdural hematomas but is of little value in cases with fluid hematomas.

Subdural rather than subarachnoid air appeared over the hemispheres in 6 or 22 cases (27 per cent). It was found in 3 of the 5 cases in which a definite diagnosis of solid hematomas was correctly made, and in 1 of the 2 cases in which the diagnosis was suggested by the encephalographic films. It was considered, correctly, to suggest the diagnosis in 1 out of 5 cases of fluid hematoma, but led to an erroneous diagnosis of fluid hematoma in 1 case in which exploration later revealed no accumulation of fluid. It is therefore apparent that subdural air over the hemispheres may be associated at times with subdural hematomas, but does not have any great diagnostic significance.

One ventriculogram and twelve encephalograms were performed successfully in 13 patients in whom the clinical diagnosis of subdural hematoma was suspected but on whom operation was not performed. In 7 of the 13 cases (54 per cent) the encephalographic studies were thought to exclude the possibility of subdural hematoma. Encephalograms in the remaining 6 cases suggested the presence of hematoma but exploration was not performed, either because of contradictory clinical evidence or because of refusal by the patient. Additional subdural air over the hemispheres was seen in 4 of the 6 cases with encephalograms which had suggested the presence of subdural hematoma.

Since no operations were performed in this latter series, the impressions derived from encephalography are not susceptible of proof. They are presented merely to demonstrate the use of encephalography in cases in which subdural hematomas are suspected. This procedure in experienced hands, however, may be of great assistance in such cases.

DISCUSSION

Cranial roentgenography is of little value in the diagnosis of subdural hematomas. The presence or absence of a cranial fracture has no bearing on the subject. No pathognomonic bone changes have been observed. The visualization of a displaced, calcified pineal gland following cranial trauma is merely suggestive evidence. Demonstration of a calcified subdural hematoma has been reported in only 3 cases, 1 having been seen in this clinic.

Encephalography appears to be of more diagnostic value. Gross compression of all segments

of one lateral ventricle, combined with a shift of the entire ventricular system to the opposite side and homolateral obliteration of the sulcal shadows, is indicative of a large flat intracranial mass. The encephalogram, however, identifies it as no more than a mass and is not diagnostic of hematoma. Furthermore, such a picture is found infrequently, and then only in cases of large, well-organized subdural hematomas.

A more practical application of encephalography is in the diagnosis of the commoner types of clot. These are the mixed and fluid varieties. In these cases the encephalographic picture appears to be quite variable. Frequently it is but little altered from the normal. As no clear-cut formulation of the pathologic appearance is possible, the diagnostic value of the encephalogram depends largely upon the knowledge and experience of the interpreter. With this reservation in mind, the variations from the normal, in order of their diagnostic importance, are as follows:

1. A slight but definite depression of the roof of one lateral ventricle associated with or without a shift of the ventricular system (and often the falx) to the side opposite the depressed ventricle, a slightly enlarged contralateral ventricle, variable contralateral hemispheric changes, and some decrease of the homolateral hemispheric markings.

The diagnosis of subdural clot is favored by complete absence of air in the subarachnoid space above the sylvian fissure homolateral with the depressed ventricle. It is important to remember that enlargement of one ventricle often makes the other ventricle by comparison appear to be depressed and flattened as from above. When ventricular shift is not present the picture is easily confused with that of moderate unilateral hemispheric atrophy, especially if there is an excess of hemispheric air on the side of the enlarged ventricle.

2. Small multiple or large single cystic areas of subdural hemispheric air associated with normal or moderately enlarged ventricles and variable subarachnoid hemispheric air.

It is essential that the cystic areas be fixed in position so that the air does not shift during the various cranial positions assumed during the making of the encephalogram. Such a picture is usually associated with durarachnoid adhesions.

3. No depression or distortion of the ventricle but an absence of subarachnoid hemispheric air on one side associated with a contralateral ventricular enlargement.

4. Unilateral subdural hemispheric air with contralateral ventricular enlargement.

Such collections of subdural air are capable by themselves of depressing and distorting the homolateral ventricle. This type of ventricular distortion is not, therefore, indicative of a mass.

5. Bilateral subdural hemispheric air with variable ventricular alterations, depending upon the amount and distribution of the air.

Freely motile subdural air over the hemispheres may be associated with subdural hematomas, but is certainly not diagnostic. It occurs much too frequently in routine examinations of patients in whom an equal percentage of hematomas is unlikely, as shown by the figures given by Holt and Pearson,¹⁸ Lemere and Barnacle,¹⁹ and Allen, Daly and Moore.²⁰ Subdural air is also a very common finding in roentgenograms taken twenty-four hours or more after encephalography. Air which has been demonstrated solely in the ventricular and subarachnoid spaces can become largely concentrated in the subdural space over the hemispheres in from ten minutes to as many hours. Whether this indicates a fragile pathologic arachnoid is not yet clear. It is certain that air may be introduced into the subdural space at the lumbar level, during the air injection. In these cases it certainly cannot have any pathological significance. Furthermore, the compression caused by subdural air often results in a ventricular compression which has been mistaken for pathologic ventricular alteration. It is therefore unwise to consider the presence of unencysted subdural air as diagnostic or even suggestive of the presence of a subdural hematoma until the significance of air in the subdural space is more thoroughly investigated. Such investigations will be reported in a subsequent paper.

CONCLUSIONS

Ordinary cranial roentgenography is of little value in the diagnosis of subdural hematomas. Demonstration of a pineal shift following cranial trauma merely suggests the presence of a mass which may or may not be a clot.

Encephalography is rarely diagnostic of subdural hematomas, and then only in cases with large chronic clots. The value of encephalography in the diagnosis of fluid hematomas appears to be negligible. Until further information is available it is unwise to lay too much stress upon the presence of unencysted subdural air as an indication of the presence of a subdural hematoma.

On the other hand, it has been demonstrated that encephalography is a valuable adjunct in the diagnosis of thin, solid subdural hematomas. It is in such cases, in which the history and examination are often inconclusive, that an experienced encephalographer may offer invaluable assistance to the neurosurgeon.

In the final analysis we continue to believe that a *definite* "diagnosis of subdural hemorrhage can be made only by exploration."

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RECTAL EVIPAL SODIUM AS A BASAL ANESTHETIC IN UROLOGIC SURGERY

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THE advantages of a basal anesthetic are well established, particularly in nervous and excitable patients, as well as in those for whom a very light inhalation or local anesthetic is indicated. Avertin, which has proved very satisfactory for this purpose, is frequently contraindicated in urologic surgery because of the high percentage of patients with renal insufficiency. Following the lead of Gwathmey,¹ who has shown that evipal sodium is effective when administered by rectum, we have given this new anesthetic a clinical trial in urologic surgery. The results in 40 cases have been very gratifying.

The age incidence of the patients in this series has varied from twelve to seventy-five. Six patients were in the second decade, 6 in the third, 5 in the fourth, 11 in the fifth, 6 in the sixth, 4 in the seventeenth and 2 in the eighth. Twenty-seven had renal disease and 15 had diminished renal function, as evidenced by nitrogenous retention and diminished phenolsulfonphthalein excretion. Twelve patients were in a state of chronic debilitation from long-standing sepsis or neoplasm. There were 3 patients who had only one kidney. Thirteen were healthy individuals undergoing an elective operation.

The amount of evipal sodium used at first was 0.2 gm. per 4.5 kg. of body weight, dissolved in distilled water to make a 10 per cent solution. An adequate estimation of the proper dosage by weight alone is impossible, and a careful consideration of the general physical condition, age and size of the patient is imperative. Thus, we now give only two thirds or three quarters of the calculated dose to patients with anemia, cachexia, obesity, severe chronic infection or nitrogenous retention. The smallest total dose used was 1.4 gm., the largest 4.3 gm. and the average 3 gm. As with intravenous evipal, young, healthy individuals, particularly if apprehensive, require large doses for satisfactory results. In these cases evipal is probably less satisfactory than avertin. For elderly or debilitated patients or those with renal insufficiency, a small dose is adequate. The rather considerable individual variation in the effective dose, which is so important in the intravenous administration of the drug, is not quite so striking when it is given

rectally. However, it must constantly be borne in mind when a supplementary anesthetic is given.

The technic of administration is similar to that used for avertin. A thorough cleansing enema is given the night before operation. One hour before the evipal is to be administered the patient is given hypodermically 0.01 gm. of morphine sulfate and 0.05 gm. of ephedrine sulfate. Evipal frequently causes a sharp fall in blood pressure, which in our experience is prevented or mitigated by the use of ephedrine. Morphine appears to have a synergistic effect with evipal and causes a prompt and deeper anesthesia. The evipal solution is introduced into the rectum through a small catheter forty-five minutes before the operation is scheduled to begin. This may be done while the

Table 1 *Types of Operation*

OPERATION	NO. OF CASES
Resuture of wound	1
Pyelotomy	11
Nephrotomy	2
Nephrectomy	5
Ureterotomy	2
Circumcision	4
Suprapubic prostatectomy	1
Nephrostomy and drainage of perirenal abscess	1
Nephropexy with plasac renal pelvis	2
Excision of the bladder	1
Orchidopexy	1
Colostomy	1
Excision hydrocele	3
Orchidectomy	3
Epididymectomy	1
Plasac on the testicle	1
Total	40

patient is on the ward, and produces a state which varies from quiet analgesia to sound sleep. An excitement stage has failed to occur in 40 cases. Vigorous patients, particularly those in the second and third decades, and alcoholics are apparently awake when brought to the operating room, but a state of amnesia, always a great boon to the patient, is invariably produced, and even the more resistant patients appear drowsy. The induction of anesthesia with gas-oxygen is quite smooth, and it is frequently possible to obtain good relaxation with as low a ratio of nitrous oxide to oxygen as 1:3.

The effect of rectal evipal in the dose used is much more prolonged than that of the usual dose given intravenously. Thus the recovery period has varied from three to twelve hours after operation. The majority of patients are very drowsy, sleep comfortably through the night without medication and remember little or nothing until the day after operation. There has been a remarkable absence of excitement, headache and vomiting fol-

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Table 2 Representative Cases in Which Rectal Evipal Was Used as a Basal Anesthetic

OPERATION	AGE	WT	AMOUNT OF EVIPAL	DIAGNOSIS	PRE-OPERATIVE MEDICATION	STATE OF ANALGESIA	SUPPLY OF ANALGESIC ANESTHESIA	INITIAL	EARLY IN OPERATION	LOWEST	END OF OPERATION	POST-OPERATIVE COMPLICATIONS	TIME ELAPSED BEFORE CONSCIOUSNESS REGAINED	REMARKS
Luxation carcinoma bladder	75	150	3	Carcinoma of bladder	mg Morphine 15	Asleep in 30 minutes	Ether 60 cc	180/90	0/0	0/0	120/75	None	4 hours	Ether stopped because of blood pressure fall. Blood pressure returned after epinephrine.
Uterectomylarceus minationosis	58	145	2.9	Carcinoma of bladder	Morphine 15	Asleep in 20 minutes	0	130/85	90/60	90/60	125/90	None	4 hours	Very satisfactory
Nephrectomy (right)	65	130	2.6	Hypertrophoma	Morphine 15 Epinephrine 50	Drowsy	Ether	150/80	100/60	85/60	85/60	None	10 hours	Difficult anaesthesia due to tendency to become cyanotic
Nephrectomy	51	135	2.7	Renal tuberculosis	Morphine 15 Epinephrine 50	Drowsy	Gas oxygen	135/70	120/70	85/45	85/45	None	6 hours	Also has pulmonary tuberculosis
Pyelotomy	42	150	3	Renal calculus	Morphine 15 Epinephrine 50	Drowsy	Ether	150/80	135/80	80/60	80/60	None	10 hours	Severe chronic pyelonephritis NPN — 45 ISP — 30%
Perirenal drainage abscess	62	120	2.4	Perirenal abscess pyonephrosis	Morphine 15 Epinephrine 50	Asleep in 15 minutes	Local novocain	120/70	90/60	90/60	90/60	1 profound narcosis	12 hours	Extremely debilitated satisfactory anaesthesia
Suprapubic prostatectomy	60	140	2.8	Benign hypertrophy prostate	Morphine 15 Epinephrine 50	Asleep in 25 minutes	Local novocain	130/70	140/60	130/70	130/70	None	5 1/2 hours	Good relaxation Very satisfactory
Nephrectomy	24	130	2.6	Caval calculus pyelonephritis	Morphine 15 Epinephrine 50 Atropin 0.5	Asleep in 25 minutes	Gas oxygen	120/60	130/60	85/60	85/60	None	6 hours	Very satisfactory
Nephrectomy	51	150	5	Renal calculus	Morphine 15 Epinephrine 50 Atropin 0.5	Drowsy	Gas oxygen	130/60	110/60	95/60	80/55	None	4 1/2 hours	Acute infection in kidney
Circumcision	14	90	1.8	Phimosis	Morphine 8 Epinephrine 25 Atropin 0.5	Very drowsy	Gas oxygen	102/68	124/70	—	—	Excited	4 hours	Ether necessary poor relaxation
Pyelotomy (right)	41	135	2.7	Bilateral renal calculus	Morphine 15 Epinephrine 50 Atropin 0.5	Asleep in 30 minutes	Ether 70 cc	90/60	90/60	90/60	90/60	None	5 hours	Satisfactory Pulmonary tuberculosis
Ureterotomy	30	140	2.8	Ureteral calculus	Morphine 15 Epinephrine 50 Atropin 0.5	Drowsy in 15 minutes	Gas oxygen	120/70	135/70	135/70	150/80	None	4 hours	Satisfactory
Urelyotomy	24	125	2.5	Calculus in solitary kidney	Morphine 15 Epinephrine 50 Atropin 0.5	Drowsy in 15 minutes	Gas oxygen	120/70	110/60	110/60	130/60	None	6 hours	Satisfactory anaesthesia chronic pyelonephritis
Orethrectomy	48	125	2.5	Tuberculosis of testicle	Morphine 15 Epinephrine 50 Atropin 0.5	Drowsy	Gas oxygen	190/110	180/100	180/100	200/120	None	4 hours	Hypertensive vascular disease
Plastic renal pelvis	40	110	1.8	Bilateral hydronephrosis	Morphine 15 Epinephrine 50 Atropin 0.5	Asleep in 20 minutes	Gas oxygen	108/90	108/68	90/60	105/70	None	—	PSP — 20% NPN — 40-55

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lowing operation. We have observed that these patients rest more quietly and are less troublesome to care for after operation than those who have received other forms of basal anesthesia. Cyanosis has not occurred as a postoperative complication. We have had no indications for the use of respiratory or cardiac stimulants. There have been no cases of postoperative shock, and the incidence of pulmonary complications in this small series has not been significant.

Table 1 presents a list of the operative procedures which have been done under rectal evipal as a basal anesthetic. Table 2 contains more detailed data on a representative group of cases. These were selected as being typical of the various groups of patients according to age, type of supplementary anesthesia and variations in the operative and postoperative courses. During operation there have been no striking changes in the pulse, respiration or blood pressure except in the cases in which ether was used as the supplementary anesthetic. In all 7 cases in which ether was used, difficulty was experienced in maintaining a sufficient depth of anesthesia without cyanosis, and in 6 there was a profound fall in the blood pressure. Consequently, ether was discontinued. Twenty-eight patients have received nitrous oxide and oxygen as a supplementary anesthetic. This combination of anesthetics has proved very satisfactory. As already noted, it frequently is possible to maintain good relaxation with a very low ratio of gas to oxygen. Of these 28 patients, 16 showed no fall in blood pressure and 5 showed only a slight fall. In 7 cases there was a fall of blood pressure of more than 30 mm of mercury. In no instance, however, was this alarming, as the general condition of the patient remained good and the lowering of the blood pressure proved to be only transitory. The

pulse rate tended to be elevated to a level which varied from ten to twenty beats per minute above the normal. No depression of the respiratory rate was noted in this series. In fact, there was frequently a slight elevation of the respiratory rate above the preoperative level for the individual patient.

Local anesthesia has been used in 4 cases, with excellent results. In 1 case no supplementary anesthetic was necessary. In these 5 cases no changes in the pulse, respiratory rate or blood pressure were noted. In patients beyond the sixth decade, local novocaine is the supplementary anesthetic of choice.

There have been no deaths which could be attributed to evipal. One patient in the series died, this was a case of extensive pyelonephritis with a perinephric abscess secondary to a blocked ureter. Death occurred one month after operation. It should be noted that although the patient was profoundly ill at the time of operation, he withstood the operative procedure under evipal and local anesthesia very well. As in our studies² with intravenous evipal, no changes in the liver or brain which could be attributed to evipal were found at autopsy.

SUMMARY

A clinical study of 40 cases in which evipal sodium was administered rectally as a basal anesthetic is presented. Ether was found unsatisfactory as a supplementary anesthetic, but gas-oxygen or local anesthesia proved highly successful. This type of basal anesthesia has a definite place in urologic surgery.

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WHAT MASSACHUSETTS DOES FOR ITS MENTAL DEFECTIVES

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BEFORE outlining the program of the Commonwealth in its state-school care of mental defectives, let us inform ourselves as to the meaning of the term Mental deficiency, or feeble-mindedness, is a condition of an arrested development of the normal structure of the brain, existing from birth or from an early age. Because of this arrested development the child shows an incomplete or imperfect development of the intelligence. This subnormal intelligence prevents the child from keeping pace with normal children of the same age. It keeps the adult from maintaining himself independently of supervision or external support.

It is important to understand the real meaning of mental deficiency. Many children and adults suffer from blindness, from deafness or from various crippling conditions. They lack the ability to see, to hear or to walk. These conditions are definite and tangible, we can see them with our own eyes and have no difficulty in understanding that the persons so afflicted are physically deficient. Now, other children and adults suffer from a similar lack or deficiency in certain nerve cells of their brains. These persons are mentally deficient. While the defect in brain structure is not visible to us, nevertheless mental defectives are to be considered crippled just as definitely as those with the more obvious physical disorders. Instead of being blind, deaf or unable to walk, they are unable to think as clearly or intelligently as persons without such brain defects†.

The various grades of mental deficiency depend upon the degree of the shortage of neurons, or "thinking" cells in the brain. In idiots we find a simple type of brain, with comparatively few neurons, and the mental age does not rise above three years. Those with a few more neurons are classified as imbeciles. The mental age of this group ranges between three and seven years. Those with brains containing a number of neurons approaching the normal are called morons. Here the mental age is higher, running between seven and eleven years. The borderline or dull normal groups are slightly higher in mental ages. Those with neurons closely packed together are normal

or superior in respect to intelligence. The measurements given apply to adults over sixteen years of age. For children we use an index, called the intelligence quotient (IQ). This is obtained by dividing the mental age by the actual physical age. Thus, a child of eight with a mental age of five years would have an intelligence quotient of 62, or 62 per cent of the normal for his particular physical age. He would be classified as a moron. We should exercise great caution, however, in being too greatly influenced by the intelligence quotient. Psychiatrists have learned, through experience, to place it last in order of importance when making a diagnosis of mental deficiency.

Is the state-school care of mental defectives something new, or has it been functioning for some time? Looking backward a bit we find that the House of Representatives, in 1846, appointed a committee, headed by Dr. Samuel J. Howe, to make a survey of idiots in Massachusetts**. Dr. Howe found 755 idiots throughout the State. When the General Court received Dr. Howe's recommendations, two years later, it generously appropriated \$2500 for the care of *ten* idiots for *one* year. We see that conservatism was a legislative trait even in those early days. In October, 1848, Dr. Howe received the first group of idiots who were to be cared for at the Perkins Institute for the Blind in Boston. Thus, there came into being the first school for the care of mental defectives in the United States. In October, 1887, Dr. Walter E. Fernald became superintendent, and the school moved to Waverley. The late Dr. Fernald's work in the development of educational and training facilities for backward children is well known throughout the country. In 1907 a second school was opened at Wrentham, under the late Dr. George L. Wallace, and in 1922, a third school at Belchertown, under Dr. George E. McPherson. At present, the three state schools are caring for about 5200 children. The capital investment of the Commonwealth in the three schools is about \$8,500,000, and the annual appropriations for maintenance total approximately \$1,800,000.

What is the general plan of attack of the Commonwealth for the care of its mental defectives? Training, training, and more training seem to be the answer to the condition known as mental deficiency. This training process is often slow and

*From the Massachusetts Department of Mental Diseases.

†A broadcast delivered from Station WEEI on Wednesday November 17.

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†It is understood of course that other factors such as conduct and social reactions play important parts in the formal diagnosis. However the basic defect in brain structure remains the paramount issue.

I am indebted to Dr. Charles S. Woodall, assistant superintendent at the Walter E. Fernald State School for aid in the matter of historical data.

laborious, owing to the necessity of repeating the subject matter over and over again. The reception of new ideas or dexterity in new pursuits comes slowly to the mental defective. While he learns slowly he also learns well, and will retain much of his instruction to the last day of his life. Unhappily he will retain faulty teachings just as thoroughly. So we see how important is the matter of the early environment. Mental defectives do not have such a keen sense of judgment as normals in deciding between right and wrong. In emergencies they fall back on the teaching of their childhood. If it has been good, they make the right decisions, if faulty, they are apt to repeat the same errors again and again.

The training program of the state schools develops along three basic lines. The first is the establishment of a desirable set of habits. The second is educational in the sense of instruction in regular schoolwork. The third is occupational training to provide a means of self-support in later life. Every child sent to the schools is given an opportunity to advance in each of these fields so far as his characteristics will permit. Some, with limited endowments, never get beyond the establishing of good habit patterns. Others make some progress in the schoolwork, but can absorb only the rudiments of occupational training. Still others go through the entire course and return to the community as self-supporting citizens.

In the second step, that of education, we find the three state schools striving to equip the children with the classical three R's—reading, writing and arithmetic. The schools at Waverley, Wrentham and Belchertown have large school departments with from fifteen to twenty-five teachers. These school departments offer the children an education suited to their mental age. There is little point in teaching eighth grade arithmetic to the fourteen-year-old mental defective, who has the mentality of a nine-year-old. Obviously, third or fourth grade arithmetic is about his limit. The child is given the school material at a slowed rate, to match his own slowed powers of comprehension. Thus, it might take an entire school year to teach the child one half or one third of the regular grade material of that year. As soon as the teachers find that no further progress is being made, the academic schoolwork is terminated. This usually occurs at the age of sixteen years.

At this point the occupational training begins, with the goal of possible placement in the community held in the background. The length of time spent in the training period depends upon the boy or girl. Some are ready in two or three years. Others take longer. Girls are given individual instruction in classroom preparation of

food and then, for a period, they act as cooks in the main kitchen or in the various kitchens of the school. The domestic science teacher takes them in hand and instructs them in table service, and for another period they act as waitresses in one of the many dining rooms throughout the school. They are taught proper methods of management of a home, the purchase of food, cleaning methods, and so forth. Later, under supervision, they are made responsible for the work of a single ward or an employee's home. The occupational teachers instruct them in many kinds of sewing and dressmaking. The girls are instructed in the care of younger children in the school hospital and become quite expert in this work. Others learn to do clerical work or typing. While the training at first is general and calculated to equip the girl in all fields, it gradually works toward a development of the high points of the girl's potentialities. Then, when a call comes in for a certain type of service, the school is able to select a girl who has shown a special aptitude in that work.

The boys do shop work of various kinds—painting, printing, shoe repairing, and so forth. They may work in the various storerooms, with the baker, with the carpenter, with the electrician, in the garage, with the various construction gangs, in the powerhouse, in the horse barn, in the dairy barn, or on the farm itself. The boys are shifted from one division to another, to diversify the training. Actually, the farm turns out the largest number of boys as our calls are chiefly for boys with this training. However, if the boys show an aptitude for any other line of work, they are allowed to specialize in that activity. For example, we have had some boys leave the schools who were excellent cooks and others who were particularly good at housework.

The social workers are a *very* important part of the state-school training program. They take complete charge of the young woman or man who is to be placed at work in the community. Many persons know of the training programs and of the excellent workers turned out by the schools. Consequently, there is little difficulty in finding positions. As soon as the girls or boys are ready, positions are carefully selected which will suit their training, their capacities and their emotional make-ups. The social workers supervise these individuals very carefully and check all financial arrangements and payments. Starting at small wages, they receive raises at regular intervals as the value of their services increases. Positions are changed occasionally. After a period of supervision many cases are discharged completely and direct their own affairs from that point on.

In 1936, Belchertown, the smallest of our three

schools, had 68 boys and girls at work for wages in the community.* This group earned over \$9200 in wages, averaging about \$2.60 per week. Board, lodging, and in some instances clothing, were provided in addition to this salary. This is not a high wage, but when one stops to consider the thousands of normal persons who were on relief for that same year, we realize that these mental defectives did very well for themselves. The same 68 boys and girls had individual savings accounts totaling over \$8000, or an average of \$119 each. On these small incomes, they had actually saved money. The boys and girls take great pride in being on their own and self-supporting. When, in addition, they have achieved the distinction of having their own personal savings accounts, their pleasure knows no bounds. To these children the savings account is a tangible symbol of their success against overwhelming odds.

Quite incidentally, the placement in the community of this group of 68 persons relieved the

*I am indebted to Dr. George E. McPherson, superintendent of the Belchertown State School, for the financial data on graduates at work in the community. The Fernald and Wrentham state schools also maintain community placement and supervision plans with even larger numbers of cases at work for wages.

Commonwealth from the annual payment of over \$26,000 for their state school maintenance. Every year that these graduates remain in the community represents a clear saving to the Commonwealth of another \$26,000. Thus, the training programs of our state schools are not only restoring mental defectives to a productive life in the community but are being financially successful as well.

Many of these handicapped boys and girls have shown remarkable adjustments in the community, and have turned out to be excellent citizens. In 99 per cent of the cases the mental defective wants to be like other people, and to do the right thing. If given his chance through suitable training he will make a quiet, inoffensive citizen, capable of hard work and self-support. Massachusetts can well be proud of the work of Drs. Fernald and Wallace and their successors, Drs. Greene, Raymond and McPherson. All these workers have stressed the potentialities for good in mental defectives. All the latter are laboring unceasingly to carry on the efficient training programs which mean so much in the community adjustment of these handicapped individuals later in life.

PROGRESS IN HEMATOLOGY IN 1936

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NO OUTSTANDING advance in the field of hematology took place during 1936. Despite this, the literature is so extensive that it has become difficult to keep abreast with even one aspect of it, such as purpura or pernicious anemia. One cannot fail but be impressed by the high caliber of the work which proceeds from so many clinics all over the world. Excellent hematologic work is being done not only in this country but in England, the Scandinavian countries, Italy and Russia. In England the literature is mainly concerned with clinical descriptions of the anemias, in the Scandinavian countries much investigation goes on regarding the pathogenesis and treatment of pernicious anemia, the Italians are concerned primarily with disorders of the spleen, particularly hemolytic anemia, and the Russians, in characteristic Soviet style, have rendered transfusions readily available to the masses.

This review represents only a sample of the world's literature. Less than two hundred articles are cited out of at least twenty times that number in the *Index Medicus*. The more important studies

are bone-marrow culture, bone-marrow biopsy, standardization of blood-cell counts, standardization of the tourniquet test, blood-transfusion methods, iron metabolism, isolation of liver-extract fractions, drug factor in purpura, lymph-node puncture, heterophile agglutination phenomenon, and the missing clotting factor in hemophilia.

BLOOD-FORMING ORGANS

Diagnostic Procedures By means of a complicated apparatus supplying an artificial "lung, kidney and circulation," Osgood and Muscovitz (*J A M A* 106:1888, 1936) reported the successful culture of human bone marrow in sufficient quantity for any hematologic or chemical procedure. The method was later simplified (Osgood and Brownlee, *J A M A* 107:123, 1936). These investigators outlined eighteen different problems which offered promise of solution by this method. Among them is one which has disturbed many people—the development of a practical test for the identification and standardization of the anti-pernicious-anemia principle. Other problems have to do with carrying on test-tube experiments relating to the various factors at fault

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in anemia, leukemia, agranulocytosis, and so forth. Whether the method, and the ambitious program outlined for it, will prove of value remains to be seen.

Many articles on biopsy of the sternal bone marrow continue to be written. Most of them are concerned with simple puncture of the marrow space with an abbreviated lumbar-puncture needle. Jaffé (*J A M A* 107 124, 1936) contributes a comprehensive review of the problem and cites the findings at biopsy in the various hematologic conditions. He concludes that the bone-marrow biopsy with a trephine as practiced by Custer and Dameshek is the method of choice for research and for systematic studies, since it permits sectioning of the marrow with preservation of the topographic relations of the cells, and also the preparation of smears and imprints. The accuracy of the simple puncture biopsy is open to much question, since the material obtained ("juice") is more often blood than marrow. (Cf. Schulzen, *Med Klin* 32 490, 1936). Despite the various defects of the puncture biopsy, its relative simplicity is of great advantage, especially when multiple punctures are contemplated. Furthermore, with increasing numbers of physicians who are interested in the findings in the marrow, the pathologic physiology of the various "blood dyscrasias" should become better appreciated.

Henning (*Med Klin* 32 542, 1936) reviews the various indications for the sternal bone-marrow biopsy. He mentions particularly his success in the diagnosis of multiple myeloma and of malignant metastasis to the bone marrow, and refers to the earlier work of Seyfarth and of Schilling in the diagnosis of malaria and kala-azar from the bone marrow. Rohr and Hegglin (*Deutsches Arch f klin Med* 129 61, 1936) were successful in finding tumor cells in sternal biopsy material from 10 of 12 cases showing tumor metastases to bone. Karavanov (*Sang* 10 562, 1936) contributes a modified technic for trephining the sternal marrow. Instead of making an incision through the skin and subcutaneous tissues, he pierces them by means of a special small trocar, through which the perforating trephine is introduced, after which marrow is removed by means of a small curette. This method seems to have some merit since with it one can obtain not only smears but pieces of tissue for sectioning.

One of the interesting investigative methods recently applied to study of the marrow cells has been that of the fluorescent microscopical technic. Porphyrin, the precursor of hemoglobin, develops a red fluorescence in the presence of ultraviolet light. Borst and Königsdorffer some years ago (1929) took advantage of this fact in studying the bone-marrow cells in various abnormal conditions,

with some particularly interesting results in pernicious anemia, in which they found that many of the megaloblastic cells contained porphyrin. They postulated from this that a gross abnormality in the "building stones" of the red cells existed in the disease. Seggel (*Folia haemat* 54 374, 1936) repeated these observations in both blood and bone-marrow smears, utilizing the same technic, and found inconstant and very slight fluorescence in the nucleated red cells of pernicious anemia, although fluorescence was noted in mature red cells and even in leukocytes. Müller-Neff (*Folia haemat* 56 18, 1936) extended these observations on "fluorescytes" and found that fluorescence was present only in young red cells (reticulocytes). This denoted that porphyrin was present during active hemoglobin formation and was therefore important in normal as well as in abnormal hemoglobin synthesis. Observations of this type, although admittedly very technical, deserve repetition because of the insight they may give to the physiology of blood formation. Another very interesting technic applied to bone-marrow cells is that of Kempner (*J Clin Investigation* 15 679, 1936), who studied, for the first time, the metabolism of human erythroblasts with the Warburg apparatus. He was fortunately able to obtain large numbers of nucleated red blood cells from the blood of a case of erythroblastic (Cooley's) anemia, and showed that the erythroblasts had a very high oxidative and fermentative metabolism, their respiration being approximately two hundred times greater than that of normal non-nucleated red blood cells. Indirectly these data indicate the relative lifelessness of the mature non-nucleated red blood cell, which is in reality not a cell but a bag containing a very active chemical—hemoglobin. The very high metabolic activity of these immature blood cells is not too surprising in view of the fact that the blood cells are the direct representatives in the adult of the primitive mesenchymal tissue. Studies of this type in bone-marrow tissue from various abnormal conditions should prove exceedingly interesting.

Wiseman, Doan and Erf (*J A M A* 106 609, 1936) bring out the very interesting reciprocal relation between the bone marrow on the one hand and lymphoid tissue on the other. By suitable animal experimentation and clinical observations, they demonstrate that with increased bone-marrow activity the lymphoid response becomes diminished, and vice versa. They postulate that there is a physiologic cellular equilibrium existing between lymphoid and myeloid tissue. Removal of a large amount of lymphoid tissue, as by splenectomy, will result in an increased activity of the marrow. Although this idea is attractive, it requires further experimental proof.

Methods In last year's review, the statement was made that "the day of the colorimeter seems gradually to be passing, and in its place is coming the era of the photometer and spectrophotometer, which utilize a given wave length of light for measurements of intensity of an unknown solution." This prediction is apparently becoming an actuality, since in many of the more advanced laboratories the colorimeter is being pushed into the limbo of forgotten instruments, owing to increasing realization of its relative inaccuracy. The "stabilized photoelectric colorimeter with light filters" of Evelyn (*J Biol Chem* 115 63, 1936) has proved its outstanding accuracy and ease of operation in many excellent laboratories. Evelyn's instrument disposes of the errors inherent in the previously used photoelectric colorimeters, and makes possible the rapid reading of concentrations of the various colored solutions used in colorimetry. It does away with the subjective element of the technician's eye, substituting for it the photoelectric cell, the fluctuations of which are transmitted to a galvanometer and depend entirely upon concentration of solution. The accuracy is within ± 2 per cent. To increase this accuracy, various types of color filters may be used for the different colorimetric procedures. Hemoglobin readings are very satisfactorily done with this apparatus.

Sedimentation rate continues to receive a large amount of attention. In common with various other investigators, Sasano, Ordway and Medlar (*Am J Clin Path* 6 432, 1936) studied the effect of various factors such as temperature, barometric pressure, manipulation and anticoagulants on the rate of erythrocyte sedimentation. They conclude that minimal and gentle handling of the blood is important, as well as the use of an isotonic anticoagulant such as 11 per cent sodium or potassium oxalate. Emphasis is placed on keeping the blood at body temperature, since this places the colloidal suspension in an environment approaching the normal. Wood (*Quart J Med* 5 1, 1936) contributes an important article on the sedimentation rate in heart disease. He found that congestive heart failure retarded the rate, and that increased rates were present in cases of active rheumatic heart disease, syphilitic aortitis and myocardial infarction. In the latter condition, the sedimentation rate was found to increase gradually to a maximum at about the end of the third week and to become slowly diminished as the infarct healed. The increase in rate is probably due to softening of the myocardium in the region of the thrombosis, whereas healing may be inferred when the rate diminishes. The somewhat accelerated rate with angina may be due to multiple tiny areas of myocardial softening. The test may be useful from

the prognostic and therapeutic standpoints, particularly in settling the vexing question of when to allow the patient to get out of bed. Since coronary disease occurs in the older age groups, it is important to know whether the sedimentation rate becomes disturbed in middle-aged and old persons. Miller (*J Lab & Clin Med* 21 1227, 1936) studied this problem and found that age had little effect, faster rates were accounted for by various abnormalities such as malignant disease, tuberculosis or cardiovascular disease. Reichel (*Med Klin* 32 1769, 1936) found the sedimentation rate increased in 90 per cent of cases with malignant tumors. Despite the nonspecific character of the test, it may thus be of value in distinguishing between the presence and absence of malignant disease.

Mean corpuscular volume, as determined by Win-trobe, is rapidly coming into greater prominence, as mentioned in previous reviews. Dunn and Sharpe (*Am J Clin Path* 6 497, 1936) have found that the necessary calculations are often a source of "perplexity and error," and propose a series of nomographic alignment charts to calculate the various indices. These charts are illustrated in the article, and may prove useful to those who do not enjoy the problems of simple arithmetic. Schartum-Hansen (*Folia haemat* 54 385, 1936) points out the very useful fact which we can confirm regarding the direct relation between the hematocrit (volume per cent of packed red cells) and the hemoglobin content. We have found that one of these observations may be used to check the other—or if we have one, the other may be roughly calculated. Thus, the approximate hematocrit may usually be reckoned by dividing the hemoglobin reading by two.

Much dissatisfaction exists with the fragility test, which as ordinarily done has many inaccuracies. Ponder has devoted many years of work to hemolysins, hemolytic systems and accurate methods, and the results have recently been assembled in a large volume (*The Mammalian Erythrocyte and the Properties of Haemolytic Systems*. Protoplasma-Monographien. Berlin: Gebrüder Borntraeger, 1934). The ordinary fragility test may be made more accurate by careful attention to volume of hypotonic salt solution, volume of the red cell suspension and degree of anemia (as measured by the hematocrit). The latter may be adjusted so that one always uses a fairly constant number of cells, even when there is present a marked anemia which will modify the results. These points are discussed by Daland and Worthley (*J Lab & Clin Med* 20 1122, 1935), who describe a modified method using hypotonic salt solution.

Wright and Lilienfeld (*Arch Int Med* 57 241, 1936) describe a *standardized tourniquet test*

which is useful in several conditions, particularly in hemorrhagic disease and in scurvy. Instead of recording a tourniquet test as negative or positive, as is usually done, these authors record the number of petechiae which appear and can be seen by the naked eye in a circle of 2.5 cm diameter, 4 cm below the crease of the elbow. The tourniquet used is the cuff of a blood-pressure machine which is inflated to a point midway between systolic and diastolic pressure and maintained for fifteen minutes. In this way the results obtained can be recorded and their variations noted from day to day.

Although not directly related to hematology, some mention should be made of *gastroscopy*, which is being used more and more for direct examination of the gastric mucosa. The relation of disorders of the stomach to anemia has become so well known that investigators have naturally become interested in it. Thus Jones, Benedict and Hampton (*Am J M Sc* 190:596, 1935) have studied the gastric mucosa in various cases of anemia. An excellent summary article of the subject of gastroscopy is contributed by Schloss (*Internat Clin* 4:1, 1936).

CERTAIN CHEMICAL CONSTITUENTS

Normal and abnormal *porphyrin metabolism* is discussed by Dobriner (*J Biol Chem* 113:1, 1936) and Watson (*J Clin Investigation* 15:327, 1936). These investigators are among the very few in this country working in this difficult but important field. In 3 cases of lead poisoning Watson was able to isolate a porphyrin established as coproporphyrin III. The anemia and stippling found so commonly in lead poisoning are probably related to disturbances in the porphyrin metabolism. Bence, Lendvai and Székely (*Ztschr f klin Med* 130:299, 1936) studied the *copper content* of the blood in anemia, and concluded that since this element was increased when there was evidence of rapid regeneration of the red cells, copper probably had a definite action on red cell growth.

BLOOD CELLS

General Kato (*J Lab & Clin Med* 20:1243, 1935) has performed a worthy service for both the clinician and the technician in putting together in simple tabular and pictorial form the origin, development and interrelation of the formed elements of the blood. The resultant schema is easy to follow, and has proved a boon to technicians. Despite the simplicity of the colored lithograph and tables, accuracy is not sacrificed. The monophyletic schema of blood-cell formation is utilized, all cells being derived from the primitive mesenchymal cell, this in turn produces "myeloblasts,"

which give rise to various types of erythroblastic and leukocytic cells. In a paper by Hansen-Prüss (*Am J Clin Path* 6:423, 1936) the blood cells are studied by the infrequently used technic of dark-field illumination. The author claims that "the method avoids the involved and somewhat unreliable technical factors encountered in the use of the supravital dyes and in staining of fixed smears." Apparently, malarial parasites are well brought out with this method, which may prove to have a very limited value. Rosahn and Casey (*Am J M Sc* 192:456, 1936) in a very careful study compared the quantitative variations in the "hemacytologic constitution" of healthy men and rabbits. The blood formula of both these mammalian types differed widely from individual to individual, indicating that there might be an inherent or constitutional variability. Thus a blood-cell formula normal for one individual may in fact be abnormal for another. This is of particular importance, the reviewer has found, in estimating whether leukopenia or leukocytosis is present in a given case. The normals of different individuals vary so widely that one should not immediately conclude that a count of 5000 white blood cells constitutes leukopenia, or that of 12,000 leukocytosis. This also holds true for the differential percentages of white cells.

Red Blood Cells Leverton and Roberts (*J A M A* 106:1459, 1936) studied the daily variations in hemoglobin and red cell counts with particular reference to the menstrual cycle in 4 normal college women. This work, which was done as part of a complete study on the iron metabolism, brought out clearly the occurrence of daily variations in both hemoglobin and red cells which were apparently unaffected by the menstrual process. The writers point to the difficulty involved in making generalizations from single observations, when rather marked daily variations are normally present. The reviewer can confirm this statement, especially when such abnormal states as pernicious anemia are followed from week to week, variations here are even more difficult to interpret. The factors of technical error, I find, are insufficiently recognized by the profession at large, which often accepts at face value the printed reports from a technician or technical laboratory.

Myerson, Loman and Dameshek (*Am J M Sc* 192:560, 1936), in studying the pharmacologic effects of benzedrine in human subjects, found that this drug when injected caused a marked increase of the erythrocyte and leukocyte counts, probably through a "squeezing" action which resulted from vasoconstriction of such organs as the spleen and marrow. Levy-Simpson and Cadness (*J Pharmacol & Exper Therap* 56:389, 1936) performed similar experiments in guinea

pigs with a closely related drug, ephedrine, and demonstrated (by splenectomy) that the spleen is not essential for the rise in red cells, leukocytes and platelets, but that ephedrine probably causes extrusion of these cells into the circulation from storage and hematopoietic centers, including the bone marrow

Langendorff and Reisner (*Folia haemat* 55 88, 1936) studied the normal reticulocyte count in man and concluded that the figures usually given—0.5 to 1 per cent—are much too low, their average figure being 11 to 17 per cent (!) The daily variations present are dependent upon the "normal rhythm of the biologic milieu" Although these conclusions are interesting, it seems strange that so many workers in widely separated laboratories have reported normal values which are under 1 per cent As for the existence of daily variations, these are doubtless correct, but their clinical value is questionable Jacobsthal (*Klin Wchnschr* 15 942, 1936) makes the interesting observation that in a new malarial infection it is the reticulocytes which are chiefly infected, not the mature red cells Ninety to 93 per cent of the infected cells are reticulocytes, this being the case, anemia more readily develops since the younger cells are being destroyed

Grunke and Diesing (*Klin Wchnschr* 15 1190 1936) found an increase in the reticulocyte percentage during the spring Forkner, Zia and Teng (*Chinese M J* 50 1191, 1936) found that the red cells exhibited rhythmic movements when studied supravivally (molecular streaming?)

BLOOD TRANSFUSION

Much is being written nowadays about blood transfusion. The Russians have their institutes of transfusion in which are kept on hand large quantities of blood of the various types, ready for immediate use As is well known, the Russians have pioneered in the use of cadaver blood, which as yet has failed to find favor in this country The chief contribution of the Russian school is, however, that of storage of the blood for a period up to two weeks, possibly longer Beyond that period, the plasma is utilized for other purposes The French now have their central clearing stations where blood of the various types is kept on hand for the different hospitals ready for instant use In Chicago, at the Cook County Hospital, a "blood bank" has been set up, which performs the functions of collecting all available blood and of dispensing it on call (What a relief this must be to long-suffering interns and technicians who spend many hours of work in typing and cross-matching many hundreds of donors!) In all fairly large hospitals, some effort might well be made

to conserve blood which is frequently wasted and to have it readily available for transfusion purposes The blood from patients with hypertension, right-sided heart failure, and polycythemia might well be utilized Large quantities of polycythemic blood are routinely used at the Beth Israel Hospital (Boston) for transfusion Pickering (*Clin Sc* 2 185, 1936) has found that blood from patients with hypertension is similar to normal blood in its content of pressor and depressor substances and is thus useful for transfusion Bock (*New Eng J Med* 215 421, 1936) summarizes the safe and sane attitude in transfusion and lists indications He finds that transfusion is done too often as a gesture, or as a "filler" to take up time during anxious hours when "something must be done" Frequently more harm than good results, particularly when reactions develop The latter are all too common, they may be due not only to incorrect typing but to other disturbances resulting in chills and fever Simple compatibility tests are not enough, in addition, both patient and donor should be typed Except in very rare instances this will avoid the tragic experiences which all too frequently occur Occasionally, intragroup reactions will occur, as described by Culbertson and Ratcliffe (*Am J M Sc* 192 471, 1936) In the case cited, both the recipient and donor were of Group O (Type IV, Moss), but a very severe renal reaction occurred, almost resulting fatally Hanging-drop compatibility tests were repeatedly negative, but by the test-tube method and the centrifuge-test method (Wiener *Blood Groups and Blood Transfusion* Springfield, Illinois Charles C Thomas, 1935) it was found that the patient's serum agglutinated the donor's cells and also that of 22 or 23 other Group O (Type IV) donors Except in two instances the hanging-drop method failed to show agglutination Because of this and another experience, Culbertson and Ratcliffe now utilize the following routine procedures in choosing a blood donor (1) grouping the patient with test serums, (2) cross-matching recipient's serum with donor's cells and donor's serum with recipient's cells, by both hanging-drop and centrifuge-test methods, and (3) Kline test of the donor They state that, although this routine may sound cumbersome, it has not slowed up the laboratory service Except in extreme emergencies one can never be too careful, even at the expense of a little more lost time. The ordinary transfusion reactions are not, however, dependent upon blood-group phenomena but are due to nonspecific protein reactions, which are probably caused in great part by technical errors Filatov, Blinov and Depp (*Arch f klin Chir* 184 647, 1936) recommend the following precautions for reducing the incidence of these reactions (1) careful cleansing

of the apparatus for blood transfusion, (2) prevention of blood clotting, (3) observance of painstaking asepsis, (4) maintenance of proper temperature of the blood and (5) using distilled water free from any impurity for the chemical solutions

Many new modifications in transfusion are being made. The use of preserved blood, referred to above, is being rapidly taken up all over the world. All the authors testify to its quick availability in emergencies and to its safety, particularly if the blood has been preserved at a constant very low temperature (1 to 4°C), and if it is used within a week. In the treatment of severe hemorrhage, as from peptic ulcer, Marriott, Kekwick and Wood (*Brit M J* 2 115, 1936) have successfully utilized continuous intravenous blood transfusion. This has proved of far greater value than the continuous infusion of large quantities of saline and dextrose solutions, and has often led to dramatic improvement in physical status and hemoglobin percentage. Citrated blood is given at the rate of from 90 to 150 cc an hour for from twelve to forty-eight hours. Fonio (*Schweiz med Wchnschr* 66 337, 1936) suggests the use of fractional blood transfusion—red cells or platelets, as needed in the individual case. The erythrocytes can be used for anemia, the platelets in thrombocytopenia and the plasma in fibrinopenia or for increasing the blood proteins. Fonio has had no direct experience with this method, which, however, appears to be of some practical value. The reviewer has given platelet transfusions in thrombocytopenia, but great care must be taken in the handling of platelets so as to prevent the formation of thrombi. Hedenius (*Acta med Scandinav* 89 263, 1936) suggests the novel method of heparinizing the donor, with consequent ability to transfuse the patient at leisure and without worry about coagulation. For once the donor is considered in an article by Merklen, Israël and Apfell (*Presse Méd* 44 1941, 1936), who studied the effect of frequent venesections in professional donors. The hemoglobin concentration was reduced in several and there was a tendency to leukopenia and neutropenia. Regeneration after venesection is fastest in the erythrocytes, slightly less rapid in the hemoglobin and still slower in the white cells.

WHITE BLOOD CELLS

Intelligent observation of changes in the numbers and characters of the blood cells will often prove of great benefit in the study of many infectious diseases. Particularly is this true of conditions in which long-standing infection is present. A very stimulating contribution along these lines is presented in a symposium on "Progress in Tuberculosis" in which are featured articles by Doan

(*Ohio State M J* 31 921, 1935) and Wiseman (*Ibid*, p 925). Liberation of the active chemical materials which make up the tubercle bacillus affects the tissues and, among other things, is reflected in alternations of quantitative relation and qualitative characteristics of the blood cells. Sabin, with her studies on the differential picture produced by the various fractions of the tubercle bacillus, has been able to state categorically that a certain fraction of the carbohydrate will produce a neutrophilic response, and so forth. On the basis of these and other observations, Wiseman lists the following hematologic changes and their possible significance:

- Red blood count
 - High—obstruction in oxygenation.
 - Low—secondary infection predominating.
- Hemoglobin
 - Low—measure of degree of toxemia.
 - Low— inadequacy of iron reserve.
- Neutrophils
 - Qualitative changes measure toxemia.
 - Quantitative changes measure caseation.
- Monocytes
 - Measure degree of proliferation of lesions.
- Lymphocytes
 - Qualitative changes measure resistance.
 - Quantitative changes measure healing.
- Sedimentation index
 - Measure of toxemia.

The word "intelligent" at the beginning of this section is used advisedly. It presupposes a thorough knowledge of the various factors which might cause changes in the blood picture, it signifies that inaccuracies of methods, variations in counts and variations in cellular relations from moment to moment must be well understood (Cf Medlar *Arch Int Med* 57 367, 1936). In other words, it is not possible to draw sweeping conclusions from routinely done differential counts. If the analyst is also the technician and in addition has a wide knowledge of the disease in question, his conclusions will be of great value. Mechanical systems for deriving the prognosis of a certain disease from mathematical formulas and simplified slide rules, are much to be deplored.

Medlar (*Arch Int Med* 57 367, 1936) contributes an important paper on "rest" and "activity" levels of leukocytes in health and disease, in which are brought out many of the thoughts noted above. The frequent normal variations in leukocyte counts even within a period of half an hour should make one wary of too exact interpretation. Too much attention, Medlar states, has been centered on the total leukocyte count, which is often of much less significance than the differential picture. Despite these variations in count, however, no serious interference in the interpretation of leukocyte counts should occur.

Mendell, Meranze and Meranze (*Am J M Sc* 192 316, 1936) continue their studies on the cytoplasmic and nuclear changes in neutrophils occurring in severe infectious states. The reviewer has pointed out many times that in pyogenic infections certain changes occur in the cytoplasm of the polymorphonuclear cells, which in general constitute an index of the severity of the infectious process. A slight degree of "toxic" change results in irregularity in staining and spacing of the cytoplasmic granules, a moderate degree results in more striking manifestations of the same type, a marked degree results in vacuolization of the cytoplasm. Mendell, Meranze and Meranze found that degenerative cytoplasmic changes occurred earlier than nuclear changes (band forms, non-filamentous forms) and were more valuable for diagnostic and prognostic interpretation than the Schilling hemogram. Of course, this depends upon the point of view, and to a great extent in the particular problem at hand, knowledge of and careful attention to both types of phenomena are of greater value than study of a single factor. Fleming (*Quart J Med* 5 105, 1936) brings out the fact that the extent and type of leukocytosis in lobar pneumonia depends to a large extent upon the type of organism present. Thus, with Type-I infection, a leukocytosis of over 20,000 is characteristic, while with Type-II infections, a leukocytosis of less than 20,000 is usually found. If the age of the patient, the duration of the illness and the bacterial type of the pneumonic infection are known, the prognostic value of the leukocyte count may be considerable. Lobar pneumonia is probably not one disease entity, but each type infection is a disease in itself.

Carey and Litzenberg (*Ann Int Med* 10 25, 1936) studied the leukocyte count in pregnancy and found that leukocytosis was a common feature. Alieff and Reekers (*Klin Wchnschr* 15 1522, 1936) describe some further cases of Pelger's syndrome. In 1930, Pelger described 2 cases which presented a constant and marked "shift to the left" of the polymorphonuclear cells, with the presence in the blood of large numbers of immature granulocytes, usually of the "young" type. Other cases were soon described, and Huet in 1932 found 2 cases in one family. Alieff and Reekers, when they found a typical case, studied the family (which was a large one) and discovered 13 cases in 40 individuals from three generations. The cause of this hereditary disorder of the bone-marrow white cells is not known, like sickling of the red cells, it may be a congenital abnormality of growth.

Many articles are still being written extolling one type of diagnostic or prognostic test above all others. The conservative view to take, it would

seem, is that tests like the leukocyte count, differential count, sedimentation rate, and so forth, are of value only as aids in evaluating symptoms. In tuberculosis, for example, Miller (*Nebraska M J* 21 140, 1936) wisely writes that the ideas regarding prognosis, degree of activity and efficacy of therapy cannot be obtained simply by taking one test as a criterion, but by consideration of a series of successive, correlated studies of the Schilling test, blood sedimentation rate and monocyte-lymphocyte ratio. These procedures may be of aid in demonstrating the presence or absence of pathologic activity. Rinkel (*J Allergy* 7 356, 1936) describes his experience with the "leukopenic index" which was devised by Vaughan for the study of "food allergy." Theoretically, if an individual is hypersensitive to a given food, his bone marrow will react with the production of a leukopenia, if he is not, a leukocytosis results. Rinkel confirms Vaughan's observations regarding the misleading character of clinical impressions and skin tests in food allergy. Since studies of this type have not as yet been well controlled, the reviewer is inclined to be very skeptical regarding them.

PLATELETS

Too often the platelet count is neglected in hematologic studies. This is mainly because of the relative difficulty of technic and the lack of a standardized method. In our own laboratory, satisfactory results have been obtained since 1930 with the use of an "indirect" method in which the fresh blood comes in contact with sodium citrate and brilliant cresyl blue (Dameshek *Arch Int Med* 50 579, 1932). Olef (*J Lab & Clin Med* 20 416, 1935) uses a somewhat more difficult but also "indirect" method. The normal platelet counts with both of these methods range between 400,000 and 800,000 per cubic millimeter. A reliable index of bone-marrow activity may be obtained from study of (1) the total leukocyte count, (2) the polymorphonuclear percentage, (3) the reticulocyte count and (4) the platelet count. Reduction in blood platelets is often the first sign of serious disease of the bone marrow and may antedate all the other signs above enumerated. Olef (*Arch Int Med* 57 1163, 1936) has also studied the differential platelet count and has divided the platelets into four groups depending upon their size. The smaller platelets are much more active functionally than the larger types (giant platelets are dwarves in function). Increased numbers of large platelets are seen in various functional abnormalities of the marrow. Arneith, whose encyclopedic treatises on the various qualitative changes in the leukocytes during infectious disease were so complicated that they were neglected for many years, now appears to be doing the same thing for the

"qualitative thrombocyte picture" (Lymphatic leukemia *Folia Haemat* 56 49, 1936 Tetanus *Deutsches Arch f klin Med* 179 51, 1936 Acute miliary tuberculosis *Klin Wchnschr* 15 964, 1936) Arneth continually stresses that the qualitative platelet reaction, like that of the erythrocytes or leukocytes, is a true biologic reaction which should give a particularly good insight into various pathologic conditions Zondek and Kaatz (*Brit M J* 2 387, 1936) conclude that the platelet count is considerably influenced by the thyroid and the thyrotropic hormones They were able to increase the count in normal individuals by administration of these substances Olef (*J Lab & Clin Med* 22 128, 1936) showed that large platelets are more mature than small ones and disintegrate more rapidly than younger ones In infectious and post-operative states the platelets are increased in number and exhibit an increased fragility which might be of significance in the pathogenesis of spontaneous venous thrombosis

ANEMIA

As emphasized by the reviewer on many occasions, anemia is the expression of some bodily change which because of one or several factors has resulted in reduction of the hemoglobin concentration or in the number of circulating red cells Anemia is never primary, and is always secondary to some cause or causes, whether or not they are readily discernible The emphasis is now placed upon the cell size rather than upon the primary or secondary character of the anemia Knowledge of the cell size may be obtained (1) by simple inspection of the stained blood smear, (2) by actual measurement of the diameter of at least one hundred red cells and (3) by determination of the hematocrit red-cell relation (mean corpuscular volume) Knowledge of the cell size immediately gives one an idea not only of possible etiology but also of the therapeutic possibilities If the red cells are small (microcytic), a deficiency of iron is present, and if hemorrhage, infection, malignancy, and so forth can be ruled out, we may be dealing with chronic hypochromic anemia, and so iron should be of great value, with large cells, some form of liver deficiency is probably present and liver extract should be beneficial, if on the other hand, the red cells tend to be of normal size, one should suspect a destructive process of the marrow, amenable neither to liver nor to iron therapy

Again, one should always remember that anemia, although a striking manifestation, is merely one symptom of many bodily changes, thus, in an iron-deficiency state the symptoms of glossitis, gray hair, flabby skin and flattened fingernails are just as important manifestations as the anemia itself

These symptoms are not the manifestations of anemia, rather the anemia and the other symptoms are manifestations of a more general deficiency of iron

IRON-DEFICIENCY STATES (CHRONIC HYPOCHROMIC ANEMIA)

Etiology Most interesting has been the decline of chlorosis and the rise of chronic ("primary") hypochromic anemia Chlorosis, apparently* so common in the Victorian Era, has by now almost disappeared Both conditions, characterized by a chronic deficiency of iron, are associated either with the beginning or the end of the menstrual cycle Although chlorosis is rarely described, it is not entirely defunct, as Patek and Heath (*J A M A* 106 1463, 1936) bring out These observers described 4 cases and demonstrated in them various factors which were probably responsible for the state of chronic iron deficiency a poor, capricious appetite, a hereditary factor in the presence of an anemic mother, hypochlorhydria or achlorhydria, and menorrhagia They emphasize that adolescent girls require much more iron than the adult male, chiefly because of the great increase in growth which takes place, together with the onset of regular loss of blood at the menstrual cycle When a girl is already at a disadvantage because of poor heredity, a poor diet or a poorly functioning gastrointestinal tract, the added demands for iron by the growing organism probably are just sufficient to bring about the condition which has been called chlorosis

The problem of iron metabolism is being pursued vigorously in various clinics Whipple and Robscheit-Robbins (*Am J M Sc* 191 11, 1936) in their group of anemic dogs found that iron given intravenously to an anemic although otherwise normal dog, will be practically completely utilized and will be returned quantitatively as newly formed hemoglobin Iron given by mouth does not result in such proportional hemoglobin production Even the optimal dosage of iron will result in only about 35 per cent utilization of the iron given These investigators could find no difference in action between the ferrous and ferric forms of this element Widdowson and McCance (*J Hyg* 36 13, 1936) assessed the total and "available" iron intakes of 63 men and 63 women of the English middle class The mean daily intake of iron for the men was 168 mg, for the women 114 mg Thirty per cent of the women took less than 10 mg of iron daily Lower hemoglobin concentrations in women may be due to insufficient

*The word apparently is used advisedly Inspection of the records of a number of cases of chlorosis indicates that various conditions with anemia were uniformly called by this name. The lack of recorded blood counts in most of the case reports makes the diagnosis even more uncertain

iron intake and to loss of iron with the menstrual cycle

Kellogg, Mettler and Purvance (*J Clin Investigation* 15 241, 1936) attempted to determine the relation between diet and digestion in hemoglobin production of experimental animals. When anemia was induced in dogs by bleeding, the feeding of beef resulted in a marked rise in hemoglobin output. When the stomach was removed, however, hemoglobin regeneration was greatly reduced. From these experiments it would appear that, once an anemia is induced and the iron reserves depleted, this state will continue if the normal gastric secretion is lacking. Mogensen (*Folia haemat* 56 206, 1936) discusses the anemia of gastric carcinoma and concludes that its main causes are undernutrition and failure of the antianemic activity of the stomach.

Heath (*M Clin North America* 19 1685, 1936) again emphasizes the importance of normal intestinal absorption for the prevention of the anemic state. With malabsorption, as in chronic diarrhea from whatever cause, iron-deficiency states readily develop even though the iron content of the food is entirely adequate. In this regard, Greppi and Deleonardi (*Clin Med Ital* 67 349, 1936) describe a typical case of "achylic hypochromic anemia" in the course of intestinal amebiasis and lamblasis in an adult.

Gray and Wintrobe (*Am J Obst & Gynec* 31 3, 1936) studied 40 cases of hypochromic microcytic anemia of obscure origin and found many gynecologic abnormalities, including uterine myomas, endometrial hyperplasia and unexplained menorrhagia. Multiple pregnancies were common. They concluded that the anemia in these cases was the result of faulty alimentary function, defective diet and excessive demands for hemoglobin (as with menorrhagia). Haden (*J A M A* 106 261, 1936) brings out the important fact that many conditions are characterized by multiple rather than by single nutritional deficiencies, whether in iron, vitamin-B complex, antipernicious anemia substance, and so forth. The deficiency may be due to a deficient intake of the specific food factors for normal needs, an insufficient supply for abnormal needs as in pregnancy, a defect in absorption or a disturbance in utilization. Bethell (*J A M A* 107 564, 1936) criticizes the view of Strauss and Castle that the temporary reduction of gastric acidity, with resultant impairment of gastric digestion, is an important causative factor in the development of the anemia of pregnancy, and concludes that this anemia is due either to a pre-existing iron depletion or an inadequate intake of protein of high biologic value during gestation. Snyder (*J Kansas M Soc* 37 143, 1936) suggests

that since in the majority of patients with idiopathic hypochromic anemia there is no history of dietary deficiency, the condition is probably caused by some difficulty in the absorption or utilization of iron by the body. The achlorhydria so commonly present, and indicative of a gastric defect is probably the central point.

In the presence of a chronic iron deficiency the following symptoms and signs of varying degrees of severity will usually develop: graying of the hair with a peculiar lack-luster appearance, a wrinkled flabby skin, sores at the corners of the mouth (perleche), a reddened and later an atrophied tongue, atrophied buccal and other mucous membranes, dysphagia and at times esophageal webs, achlorhydria, flattened, brittle fingernails and finally diminution in the amount of circulating hemoglobin, with a resultant lowering of the color index and microcytosis and achromia of the red blood cells.

Treatment Treatment with almost any preparation of inorganic iron, provided it is given in sufficient dosage, will almost invariably result in prompt amelioration of symptoms and improvement of the physical signs and the blood picture. Witts (*Lancet* 1 1, 1936) contributes an important article on the therapeutic action of iron in which are discussed the hematopoietic area of the alimentary tract, the normal and abnormal iron requirement, the potentiation and antagonization of iron and the dosage of different preparations of iron. Witts discusses the variability in the individual reaction to the same dose of an iron salt, an average effective dose is that which produces an average increase of over 1 per cent of hemoglobin a day in a sufficiently large number of patients with achlorhydria and anemia. Injection of iron is hazardous because the therapeutic dose is so close to the toxic dose. The therapeutic activity of preparations given by mouth is in direct proportion to their solubility and to the ease with which they yield free ions of ferrous iron. The soluble ferrous salts are the most effective, from 20 to 100 per cent of such salts are utilized, depending upon the dose given. (The reviewer uses ferrous sulfate ["exsiccated"] in a dosage of 12 to 15 gr daily.)

With regard to "potentiation" of iron, Pituk (*Arch Int Med* 57 73, 1936) describes the results of iron and chlorophyll products, administered separately and combined, and orally and parenterally, to patients with chronic hypochromic anemia. By using the "double reticulocyte response" method, he found that an enhanced effect occurred with the use of preparations of chlorophyll. The study suggests that the body can use preformed pyrrol substances in the regeneration of hemoglobin, and should encourage the liberal use of greenstuffs and protein foods in the diet.

Hughes and Latner (*J Physiol* 86 388, 1936) state, however, that chlorophyll may act as a physiologic stimulant of the bone marrow without being directly concerned in the chemical regeneration of the porphyrin groupings

PERNICIOUS ANEMIA

Etiology Pernicious anemia may be considered as a symptom complex which is the end result of a long-continued deficiency of liver extract within the body. This deficiency may be brought about in many ways: an inadequate diet, an impaired gastric function, disordered intestinal absorption, depletion of storage reservoirs in the liver or a combination of these. The end results of liver deficiency are seen characteristically in the hair, the tongue, the gastric mucosa, the central nervous system and the bone marrow. The megaloblastic changes in the bone marrow are sooner or later reflected in the peripheral blood, which shows an anemia with large red cells, leukopenia and a reduction in platelets. Because of the striking character of the blood picture, the disease has for many years been considered as primarily an anemia. In reality, the anemia present is only *one* of the many manifestations of liver-extract deficiency, which in turn is brought about by many diverse causes. The anemia of the disease called pernicious anemia is no more a "primary" condition than is the anemia of a case of "secondary" anemia. In the first instance, the red cells are large (because of the megaloblastic character of the liver-deficient bone marrow), whereas in the second instance the cells are small and hypochromic.

Although many etiologic factors may be cited as contributing to the development of the symptom complex, the outstanding feature is usually the striking abnormality in the gastric juice, which Castle demonstrated was due to the absence of an enzyme (intrinsic substance) active in the digestion of protein- and vitamin-B-containing foods (extrinsic substance). Without this enzyme, these foods are insufficiently digested, the bone marrow (and presumably other organs such as the central nervous system) do not receive sufficient material for normal activity, and so the well-known changes result.

Goldhamer (*Am J M Sc* 191 405 1936) found that the intrinsic substance was present in cases of pernicious anemia but in greatly reduced amounts, chiefly because the gastric juice was itself greatly reduced in quantity. The degree of reduction in intrinsic substance varied from patient to patient. This work is important because it explains the development of pernicious anemia in some patients following a more or less prolonged dietary deficiency, and conversely the good response to treatment in certain instances following

a good diet or the feeding of large amounts of vitamin-B complex.

Greenspon (*J A M A* 106 266, 1936) reanalyzed Castle's fundamental experiments on the basis of another explanation which had suggested itself to him. He found that gastric extract (ventriculin) was without effect in the presence of pepsin, but that depepsinized ventriculin was highly effective. He suspected that the extrinsic factor (meat) of Castle's feeding experiments acted simply as an agent in the adsorption of pepsin, this rendered the enzyme inactive and allowed the intrinsic substance to act unimpeded. In other words, the extrinsic-intrinsic interaction of Castle was subject to a different interpretation than that given by its author. Greenspon concluded that it is not necessary to postulate the presence of an extrinsic factor in pernicious anemia, but that the disease was inherently caused by a defect in intrinsic substance.

This work of Greenspon's, which caused a mild sensation when reported in the *Journal of the American Medical Association*, where it received extensive editorial comment, has been uniformly rejected by a number of different investigators. Thus Ungley (*Lancet* 1 1232, 1936) found that completely depepsinized gastric juice and pepsin-free extracts of pylorus mucosa had little or no hematopoietic effect when given orally, unless the interaction with a source of extrinsic factor (for example, autolyzed yeast) was allowed. They also found that the interaction of intrinsic and extrinsic factors did not require incubation outside the body, implying therefore that Greenspon's experiments might have been misinterpreted because that observer failed to allow completely for such a contingency. Hanes, Hansen-Prüss and Edwards (*J A M A* 106 2058, 1936) obtained completely negative results by feeding depepsinized gastric juice to 5 patients with pernicious anemia; they also suggested that Greenspon's results might have been due to the presence of extrinsic factor either in the stomach of the patient or in the gastric juice of the donor. Castle and Ham (*J A M A* 107 1456, 1936) repeated all Greenspon's experiments, reanalyzed Castle's previous results and conducted some new experiments. All this work tended to show that Greenspon had not adequately controlled the factor of food administration, and that an interaction between the intrinsic and extrinsic substances must have occurred within the body. Castle concedes, however, that pepsin does have some inhibitory effect, especially when gastric juice digestion mixtures are allowed to stand for some time. Other facts not brought out by Greenspon are that the gastric juice in pernicious anemia is completely devoid of pepsin, that gastric juice

alone has no effect and that ventriculin and gastric mucosa are not suitable for experimentation, since they contain (as Castle has shown) not only intrinsic but extrinsic substances which by their interaction provide material that stimulates bone marrow

Vladov, Bagdasarov, Dulcin and Bondarenko (*Acta med Scandinav* 88 295 1936) in experimental gastric resection in dogs found that the anemia which developed varied in type depending upon some constitutional factor as yet undetermined. Resections of different portions of the stomach indicated that Castle's factor was produced both in the fundus and in the pylorus and was probably a ferment, not a hormone. Bence (*Ztschr f klin Med* 130 275, 1936) found that following total gastrectomy in dogs a microcytic, hypochromic anemia at first developed, which gradually became modified in one or two years to a megalocytic, hyperchromic anemia, with all the other features of pernicious anemia in the blood and bone marrow. Cheney (*Am J Digest Dis & Nutrition* 3 341, 1936) concludes, on the basis of treating patients with pernicious anemia with a mixture of liver extract and duodenal mucosa, that Castle's gastric factor is present in the duodenum in a concentration equal to or greater than that in the stomach. This is in line with the work of Meulengracht (*Acta Med Scandinav* 85 79, 1935), who showed that the "pyloric gland organ" (presumably producing intrinsic factor) might be present as far down as the middle of the small bowel. The presence of active tissue in the duodenum would explain the failure of all cases of human total gastrectomy to develop pernicious anemia. Cheney prefers to consider pernicious anemia as due to a combined gastroduodenal defect. It is probably better, however, to consider that the disease is the end result of several different types of abnormalities which in many cases are combined.

Berger and Grill (*Folia haemat* 54 398, 1936) state that in the present state of our knowledge pernicious anemia is brought about by (1) occult causes, accounting for most of the cases, (2) parasites, (3) infections such as lues, (4) impairment of hormones as in pregnancy and old age and (5) gastrointestinal changes. Chemical causes are exceedingly rare, the authors describe a case which is said to have been caused by long-continued carbon-monoxide absorption from a badly functioning stove. The relations between the stove, the carbon-monoxide poisoning and the development of the disease are, it must be admitted, well worked out, although nothing definite is proved. The writers hazard the conjecture that continued absorption of carbon monoxide by the blood stream resulted in changes in the gastric mucosa, with diminution

in the production of both hydrochloric acid and the various enzymes

Pathology and Symptoms Jones (*Proc Soc Exper Biol & Med* 34 694, 1936) in a preliminary paper reports studies of biopsied pernicious-anemia bone marrow during relapse, and makes the point that the entire marrow is involved ("panmyelopathy"). Not only is the red cell series affected with proliferation of megaloblastic cells, but abnormal leukocytic and megakaryocytic growth takes place. Similar studies, together with a correlation of the blood and bone-marrow picture, both in relapse and following induced remission by liver extract, are described by Dameshek and Valentine (*Arch Path* 23 159, 1937). In this paper a sharp line of demarcation is drawn between the liver-deficient type of erythropoiesis (megaloblastic) and the normal and iron-deficient type (normoblastic). The "total" character of the bone-marrow involvement is also emphasized. Hoffmann (*Klin Wchnschr* 15 598, 1936) in studying the white blood-cell picture in the disease concludes that liver extract acts not only on the red cells but on the leukocytes as well. If the platelets had been studied, the same conclusion would have been drawn regarding this blood element. In other words, liver-extract deficiency brings about changes in the red cells, white cells, platelets, hair, tongue, gastrointestinal mucosa and central nervous system. Great variation in the localization of the deficiency is present. This is well brought out in the central-nervous-system manifestations. Turrelles and Vázquez (*Semana Méd* 2 1583, 1936) discuss this factor, and describe a case with marked involvement of the posterior columns of the spinal cord in the cervical region. Cohen (*Lancet* 2 1202, 1936) describes 2 cases in which optic atrophy preceded by a considerable period the clinical manifestations of pernicious anemia and were quickly benefited by treatment with liver extract. The reviewer has also observed 2 such cases.

Treatment Aside from etiologic considerations, most of the articles about pernicious anemia are concerned with therapy. A completely satisfactory method for the assay of various antianemic substances has not yet been discovered, despite some interesting observations regarding the reticulocyte responses which occur in guinea pigs. In last year's review, mention was made of Jacobson's method of assaying the potency of liver extract in guinea pigs. This method has since been criticized by Goodman, Geiger and Klumpp (*J Klin Investigation* 15 435, 1936), who on the basis of a large and well-controlled series of experiments conclude "The normal adult guinea

pig shows considerable and unpredictable spontaneous fluctuations in reticulocyte levels. These variations are of such a nature as to render this normal animal unsuitable for assaying the potency of materials effective in pernicious anemia. Unfortunately, the human assay of liver extract must still remain the only completely satisfactory one at present, although this too is beset with many difficulties.

Gänsslen (*Med Klin* 32 533, 1936) reports on the treatment of pernicious anemia with minimal doses of a parenteral liver extract, Campolon (Winthrop). This investigator, who prepared the first commercial extract for injection, found that he could obtain strikingly effective results, often maximal, following the injection of only from 2 to 6 cc of liver extract (derived from 20 to 60 gm) and given in one dose. In one case 2 cc of this relatively dilute extract given once resulted in an excellent reticulocyte response, which was followed without further treatment by a rise in erythrocyte count from 1.8 to 4.1 million in four weeks. He makes the important observation that the daily injection of parenteral extract with the subsequent careful follow-up of the reticulocyte count (as recommended by Dameshek and Castle and now prescribed by the Council on Pharmacy and Chemistry of the American Medical Association) may be misleading, since the reticulocyte reactions obtained might all have been caused by the first injection given. (This is true if maximal injections are given, but not when suboptimal doses are administered.) Be this as it may, all observers are agreed that the maintenance dose varies greatly from patient to patient, and must be determined in each case by a careful follow-up study.

Subbarow, Jacobson and Fiske (*New Eng J Med* 214 194, 1936, and *J Am Chem Soc* 58 2234, 1936) continue their important studies on the isolation of the active "pernicious-anemia principle" in liver. A number of different fractions have already been isolated, and it is probable that some of these fractions exert a primary or initiating therapeutic action, whereas others augment and complete the reaction. In the last paper by these writers fractions H and I are described, together with their clinical activity in cases of pernicious anemia (no mention is made of assaying the extracts by the use of guinea pigs). A somewhat similar fraction has been isolated by the Scandinavian investigators, Laland and Klem (*Acta med Scandinav* 88 620, 1936), and has been clinically tested by Strandell, Poulsson and Schartum-Hansen (*Acta med Scandinav* 88 624, 1936). A "good antianemic effect" was obtained by use of an aqueous solution containing 0.7 mg (1) of this fraction.

The number of extracts of liver for clinical use is becoming bewildering. One often wonders why the pharmaceutical houses go to such pains to produce, concentrate, refine and advertise their extracts in view of the relative scarcity of cases of pernicious anemia. It is probably because injections of liver extract are given almost indiscriminately for any case presenting anemia, whether this is hemorrhagic, nephritic or leukemic in origin. In reality liver extract is of value only in liver-extract deficiency states (pernicious anemia and related conditions). Its use following hemorrhage in chronic iron deficiency and in other conditions is wasteful of the patient's money and of no value whatever to him. In pernicious anemia, the type of extract to use and its dosage must depend on the patient and the preference of the physician. Almost any injectable extract now on the market will produce a satisfactory reticulocyte and erythrocyte response provided it is given in sufficient quantity. It is true that some extracts far exceed others in potency, but with present-day concentration large amounts of active principle can be given in relatively small total amounts of solution. In cases of pernicious anemia with neurologic symptoms larger and more frequent doses of parenteral extract must be given to obtain successful results. Hyland and Farquharson (*Arch Neurol & Psych* 36 1166, 1936) recommend, in addition to liver extract, keeping the patient in bed during the early months of treatment. Reactions to liver extract sometimes occur, and these may be coped with by desensitization procedures or by changing to an extract from a different animal. Most extracts are made from pig liver. Campolon (Winthrop) is derived from beef liver and Chappell's liver extract from horse liver.

MACROCYTIC ANEMIA NOT PERNICIOUS ANEMIA

An increase in the average red-cell diameter and in the mean corpuscular volume is not pathognomonic of pernicious anemia. Aside from related conditions (caused by a gross dietary gastrointestinal disturbance) which are in reality as much entitled to the designation "pernicious anemia" as the so called primary disease itself, there are a number of conditions associated with macrocytosis of the red cells. Much interest has developed in recent years in the macrocytic anemia of hepatic disease and its possible relation to pernicious anemia.

Wintrobe (*Arch Int Med* 57 289, 1936) has been one of the chief advocates of the essentially identical nature of the macrocytic anemia of liver disease and pernicious anemia. He studied 132 cases of severe hepatic disease, including examples of cirrhosis, malignant disease and various miscellaneous disorders. No anemia was present in

30 cases, macrocytic anemia was present in 43, normocytic anemia in 40 and microcytic anemia in 19. The mean red-cell count in the group of cases with macrocytic anemia was 3.48 million and the mean corpuscular volume 103 cubic microns. In 4 cases of macrocytic anemia there was some response to treatment with liver extract. Foci of extramedullary hematopoiesis were found in the spleens of several cases at postmortem examination. Wintrobe concluded that the macrocytic anemia of hepatic disease was morphologically similar to that of pernicious anemia, if not identical with it. The evidence at present, Wintrobe states, suggests that when damage to the liver is so extensive that storage is interfered with, and when it has been of sufficient duration to permit exhaustion of the hematopoietic principle already present, macrocytic anemia develops. Only a few studies of the bone marrow were made in these cases, and these failed to reveal anything but a slight hyperplasia in some of them.

There can be no question that the anemia in these cases of hepatic disease was caused, at least in part, by disease of the liver, but very little convincing evidence that the anemia is identical with that of pernicious anemia is presented. Too much emphasis is placed, it seems to the reviewer, on minor changes in the mean corpuscular volume. Anything above 94 cubic microns is considered macrocytic, this may be strictly true, but many a case presenting anemia shows a mean corpuscular volume up to 105 cubic microns, without definite macrocytosis being present, as seen in the blood smear. The macrocytic anemia, if present, in certain of these cases might have been caused by red-cell abnormalities which have nothing in common with the fundamental megaloblastic abnormality of true pernicious anemia. The liver is undoubtedly a storage reservoir, but it is probably not the only one in the body, with loss of hepatic function the body may still get liver substance through the diet, and may call upon stores in the kidneys and other organs.

On the experimental side, Higgins and Stasney (*Folia haemat* 54 129, 1936) produced cirrhosis of the liver in rats by causing them to inhale the fumes of carbon tetrachloride. A marked anemia of the macrocytic variety developed, although hypochromasia was, paradoxically enough, also present. These authors felt that there was definite correlation between the extent of the hepatic cirrhosis, the degree of the anemia and the extent of the macrocytosis. Goldhamer (*Cyclopedia of Medicine* [Rev Vol.] P 137 Philadelphia F A Davis Co., 1936) cites some previous experimental work in which an extract prepared from a case of severe alcoholic cirrhosis of the liver with a very low red-

cell count failed to produce a response in a case of pernicious anemia when it was given parenterally. Goldhamer states that five factors may produce a microcytic anemia: deficiency of extrinsic factor, deficiency of intrinsic factor, deficient absorption from the bowel, deficient storage in the liver, and lack of utilization by the body tissues. In the present state of our knowledge it is not possible to accept definitely the concept of Wintrobe and others that the macrocytic anemia of hepatic disease is identical with that of pernicious anemia. What has come out of these studies is the emphasis on the role of the liver as a storage reservoir and the fact that large red cells may occur with hepatic disease.

The fifth of Goldhamer's factors, impaired utilization, has recently been the subject of an interesting article by Israels and Wilkinson (*Quart J Med* 5 69, 1936). These authors describe a group of 4 cases in which, although the blood picture and most of the clinical features were quite typical of pernicious anemia, there was free hydrochloric acid in the gastric juice and a failure of response to specific antianemic therapy. Despite numerous transfusions, the cases all ended fatally. Because the bone marrow was typically megaloblastic, because there was no response to liver therapy and because the liver itself when assayed later showed adequate antianemic substance, the authors concluded that there must be a failure of utilization ("achrestia") of liver substance from the normal stores in the body and from substances injected into the body. They consider that although these cases are rare, they comprise a distinct group which are labeled achrestic anemia. Whether or not the speculation that there is impaired utilization is correct, the hypothesis is an intriguing one. Confirmation is needed before it can be accepted.

Napier (*Lancet* 2 679, 1936) describes 11 cases of tropical macrocytic anemia probably caused in great part by vitamin-B deficiency, since they responded to treatment with an autolyzed yeast preparation without added liver. Hanes and McBryde (*Arch Int Med* 58 1, 1936) discuss a syndrome which has acquired many different names during its curious history: nontropical sprue, idiopathic steatorrhea, Gee's disease and celiac disease. The "sprue syndrome" is probably a better name, it has no relation to tropical residence, and is probably a deficiency syndrome closely related to tropical sprue. Macrocytic anemia is usually present, and is remarkably benefited by adequate liver therapy. Macrocytic anemia may also occur in a variety of intestinal conditions, as pointed out by Butt and Watkins (*Ann Int Med* 10 222, 1936), particularly in disorders of the terminal ileum. Liver extract may be of no value in these

cases, which are benefited by surgical procedures Cheney (*Folia haemat* 56 28, 1936) describes a "megalocytic hypochromic" anemia in pancreatic disease

HEMOLYTIC ANEMIAS

It is customary to group under this title not only congenital and acquired hemolytic jaundice, but erythroblastic (Cooley's) anemia and sickle-cell anemia, although it is recognized that the hemolytic factor in the latter two conditions may be slight

Most observers have accepted Haden's views that the essential abnormality in congenital hemolytic jaundice is that of the red cell, which is abnormally small, round and thick ("spherocyte") and thus more susceptible to hemolysis. There is, however, something to be said for the opposing view which holds that the abnormality lies in an unusually active reticuloendothelial system (spleen, and so forth), which destroys more red cells than is normally the case. Along these lines are the observations of Levi and Bairati (*Am J M Sc* 190 610, 1935), who demonstrated that after splenectomy in 1 case of congenital hemolytic jaundice the red cells became larger and their fragility somewhat diminished. This indicates that the bone marrow was capable of normal erythrocyte production but that the spleen was primarily at fault. If the reader is particularly interested in this phase of the problem, two Italian articles are of great interest, those by Levi (*Haematologica* 16 1001, 1935) and by Dominici (*Ibid* 17 185, 1936). The latter article gives a thorough discussion of the two theories involved, either or both of which may be correct.

A most unusual report is that of Scott (*Lancet* 2 872, 1935), who reports the sudden development of acute hemoclastic crises in 4 children of one family. Although the crises of sudden anemia with jaundice occurred in sequence within a period of three weeks, no common cause could be demonstrated. All the children showed unusually labile ("accordion-like") splenic enlargement. The development of hemoclastic crises in cases of congenital hemolytic icterus, although rare, is an important phenomenon from the therapeutic standpoint, for unless energetic treatment, particularly transfusions, is resorted to the patient may die of anemia. Certain of these cases may require "emergency" splenectomies, as pointed out by Doan, Curtis and Wiseman (*J A M A* 105 1567, 1935).

Many kinds of hemolytic anemia in addition to the well-defined one of congenital hemolytic jaundice are being reported, with the result that the literature on this subject is chaotic. This is particularly true of the acute types of hemolytic

anemias, which many authors indiscriminately classify under Lederer's anemia. The latter disorder, described some years ago by Max Lederer, is thought to be infectious in origin and is characterized by rapidly progressive hemolytic anemia, dramatically cured by transfusion. Lovibond (*Lancet* 2 1395, 1935), among others, reports a case of macrocytic hemolytic anemia in which transfusions were of no value and which was responding to splenectomy until the patient died of sepsis. Several similar cases have been reported, and the reviewer has recently seen 3 more in which dramatic recovery followed splenectomy. Is this Lederer's anemia, or another type? Owing to the fact that no sharp dividing lines have been drawn between the various types of acute hemolytic anemia, which although superficially similar may be as apart as the poles, cases are being reported under many different headings, and doubtless a number of rare cases are not recognized with resultant fatal exitus. To miss an opportunity for splenectomy in a suitable case may be a fatal error.

In a fascinating article, Hamburger and Bernstein (*Am J M Sc* 192 310, 1936) describe an uncommon type of chronic hemolytic anemia associated with paroxysmal hemoglobinuria. There were anemia, reticulocytosis and perpetual hemoglobinemia, the urine always contained urobilin and hemosiderin. Transfusions and splenectomy did more harm than good. Waugh (*Am J M Sc* 191 160, 1936) reports 2 cases of severe hemolytic anemia in carcinomatosis, with extensive involvement of bone and bone marrow. These cases are chiefly of interest from the diagnostic point of view, since cases of metastatic malignancy and of Hodgkin's disease may occasionally present themselves as hemolytic anemia.

"SPLENIC ANEMIA"

Klemperer (*Am J Clin Path* 6 99, 1936), in a very important paper on the pathologic anatomy of splenomegaly, calls attention to the fact that gross enlargement of the spleen does not necessarily indicate primary involvement of that organ, since enlargement occurs in a host of varied conditions, and the spleen is an organ in which large numbers of reticuloendothelial cells are concentrated. Klemperer believes that such vague diagnoses as Banti's disease and splenogenous anemias should be abolished. It is at present impossible to classify the various disorders associated with splenic enlargement on etiologic or physiologic grounds, so that a "morphologic-pathogenetic" classification might be best. According to this method, splenomegaly may be classified as (1) inflammatory (bacterial endocarditis, malaria, syphilis), (2) infiltrative (Gaucher's disease, and so forth), (3) hyperplastic (polycythemia, purpura, and so forth), (4)

neoplasm, (5) cysts and (6) chronic disturbances of blood circulation, as in obstruction of the portal or splenic veins and in cirrhosis of the liver. In the last-named condition, the spleen was enlarged in 79 per cent of the cases. Klemperer very carefully outlines Banti's original conception of a "new" disease characterized by splenomegaly and later by cirrhosis of the liver, and concludes that neither the clinical picture nor the histologic splenic lesions are specific, but may occur in many other conditions. He makes this cogent observation: "The alleged favorable results of splenectomy at this [the early] stage cannot be used as a basis for diagnosis of this disease, because there is no evidence to prove that the progress of the disease was actually arrested."

Rousselot (*J A M A* 107 1788, 1936) studied 31 cases presenting splenomegaly, anemia and leukopenia, often with intestinal hemorrhages and sometimes with ascites. These comprised a heterogeneous group consisting of 9 cases of Laennec's cirrhosis, 2 of unclassified cirrhosis, 2 of schistosomiasis infestation, 2 of thrombosis of the splenic vein, 1 of cavernomatous transformation of the portal vein and 15 in which the obstructive factor was not demonstrated. The feature stressed by this author is the hypertension in the portal circulation, which is caused by an "obstructive" factor, either demonstrable or speculative. Splenic venous-pressure determinations in a few cases gave much higher readings than in the peripheral venous circulation. The results of splenectomy are presented. This major procedure should be avoided when hematemesis has already occurred, and also when there is marked involvement of the liver. The best results of operation occurred where an obstructive factor in the portal circulation could not be demonstrated, in 10 of 15 of these cases, the patients were alive and well from four to ten years after operation. Concomitant with clinical improvement, there was usually a rise in the various blood values.

MISCELLANEOUS TYPES OF ANEMIA

The anemia in pregnancy was studied by Boycott (*Lancet* 1 1165, 1936). Cases with normal and with subnormal color indices were equally divided. The cases with normal color index might be caused by a simple dilution of red cells dependent upon an increased plasma volume, which is irregularly present in pregnancy. Those with a low color index belong to the iron-deficiency group and respond readily to iron. Bethell (*J A M A* 107 564, 1936) contributes an important article on the hematologic changes in pregnancy in which he criticizes the view of Strauss (*Ann Int Med* 9 38, 1935) that the anemia of pregnancy can be

simply classified in two types: an iron-deficient (hypochromic) and a liver-deficient (pernicious). Bethell contends that there are cases which do not respond to iron and which are not macrocytic, but normocytic. These cases are usually associated with a low-serum-albumin level and respond to a high-protein diet. The reviewer can confirm these data of Bethell's in a few cases. On the other hand, it is important to recognize the macrocytic (pernicious) type of anemia in pregnancy in its incipency, because these cases may go rapidly downhill, and are exceedingly refractory to even very large doses of parenteral liver extract.

Kato (*J Pediat* 9 433, 1936) and Astwood (*Canad M A J* 34 501, 1936) report cases of aplastic anemia in which the etiologic factor was not discernible, although in Kato's case the child was fond of inhaling the odors of kerosene and gasoline. Astwood's case is distinguished by its complete recovery, which was apparently consummated by eight transfusions with such supplemental drugs as liver extract, iron, yeast, raw bone marrow, epinephrine and ephedrine. The great majority of the idiopathic cases are fatal, those with a readily discernible etiology (arsenic, arsphenamine, benzol, and so forth) stand a fairly good chance for recovery provided that supportive measures, chiefly transfusions of blood, are persisted in. Astwood rightly criticizes the concept of complete bone-marrow aplasia as necessary to the diagnosis of aplastic anemia. Small islands of hematopoietic tissue may be present and may act as centers of regeneration, thus justifying continued transfusions.

POLYCYTHEMIA

The etiology of the "true" or "primary" type of polycythemia is still unsolved, although most observers suspect that an anovemic condition of the marrow is present. An attempt to bolster this conception is the work of Reznikoff and his collaborators, already referred to in last year's review, this indicated that the blood vessels of the marrow showed evidence of disease. From the experimental standpoint, it is difficult if not impossible to interfere with the circulation of such a widely scattered organ as the marrow, and from the clinical standpoint it must be admitted that only an occasional marrow in polycythemia will show the well-defined changes pictured by Reznikoff and his collaborators. The theory that the disease is caused by a hypersecretion of "Addison" and therefore the antithesis of pernicious anemia (Morris and collaborators) has been discredited. About a quarter of the reviewer's cases of polycythemia present achlorhydria, and in most the free acid is present in normal or some-

what diminished quantity. Peptic (gastric or duodenal) ulcer is present not infrequently—in 4 of 25 cases observed at the Beth Israel Hospital. Kraemer and Asher (*Am J M Sc* 191 234, 1936) report 2 cases in which duodenal ulcer and erythremia were coexistent, and refer to the report of Wilbur and Ochsner (*Ann Int Med* 8 1667, 1935), who found that 8 per cent of the 143 cases of polycythemia at the Mayo Clinic presented peptic ulcer. Kraemer and Asher attempted to reduce the red-cell count in one of the above 2 cases by daily gastric lavage. The patient's ulcer symptoms were relieved but his red-cell count showed no change and the therapy was discontinued. The most important etiologic factor seems to be racial, as observed by Reznikoff. Twenty-four of our 25 patients were Jewish, most of them of Russian or Polish origin. Statistics from most large clinics show that polycythemic patients are usually Jewish, although this group may number only about 10 per cent of the hospital population.

Certain cases of polycythemia with known etiology are of interest, particularly those in which pulmonary arteriosclerosis is present (Ayerza's disease). Darley and Doan (*Am J M Sc* 191 633, 1936) report a well-studied case of this sort in which there was extensive pulmonary arteriolar sclerosis with dilatation of the pulmonary artery and right ventricular hypertrophy. The red cell count was about 7.5 million, and the total blood volume was increased.

In our experience, the diagnosis of polycythemia is frequently missed, and the patient may go about for several years with his ailment labeled as heart disease, vascular disease of the extremities, migraine, and so forth. The diagnosis should be considered in all individuals with a plethoric appearance, particularly if they are of Jewish origin. A hemoglobin test by the commonly used Tallqvist method is of no value, so that a red cell count should be done in suspected instances. It might be well to perform this count in all cases of vascular disease of the extremities, the occasional discovery of the disease discovered in this manner more than compensates for the many normal counts.

Treatment of the condition is still unsettled, some observers continuing to recommend phenylhydrazine, others x-ray therapy, and others frequent venesections. Phenylhydrazine is a difficult drug to control, requiring much co-operation by the patient. X-ray therapy is expensive, drastic and in the reviewer's experience almost always unsuccessful. Hunter (*New Eng J Med* 214 1123, 1936) reports excellent results with spray radium in 2 cases. We have been unable to affect the disease at all in 3 cases, in spite of using small

dosage in spray form as recommended by Hunter. Our chief reliance in recent years has been on the production of an iron-deficiency state. This consists in the removal of 500 cc of blood twice weekly for three or four weeks at the beginning of treatment, followed by the induction of a diet deficient in iron. With this method the patient's symptoms completely clear up, the hemoglobin is kept between 75 and 85 per cent of normal and the erythrocyte count between 50 and 70 million. The hematocrit and hemoglobin tests are the important factors to watch, and these generally remain at normal or slightly low levels for from six to nine months, following which another small series of venesections is given. (The venesected blood may be used for transfusion purposes.) The method has proved very successful in 10 successive patients, and is entirely free of the dangers of phenylhydrazine toxicity and drastic roentgen ray therapy.

DISORDERS OF THE WHITE BLOOD CELLS

Glandular Fever. Unfortunately, last year's statement in this review that glandular fever is one of the most commonly overlooked diseases in general practice does not require modification at this time. Davidsohn (*J A M A* 108 289, 1937) points out the many conditions with which the disease is often confused. Grippe is of course the most obvious, the patient has a sore throat and slight fever, and the lymphadenopathy is not suspected. Since abdominal pain is present in some 20 per cent of the cases, owing to involvement of mesenteric lymph nodes, the diagnosis of appendicitis may be made and the patient operated on. Furthermore, since the leukocyte count is commonly elevated and a differential count is rarely done, it is readily seen how the error may be made. Some of the cases of so-called mesenteric adenitis are in reality examples of the more generalized disorder, infectious mononucleosis. The reviewer has seen cases of so-called catarrhal jaundice, purpura or streptococcal sore throat prove to be typical examples of the disease, once the lymphadenopathy and the blood picture were recognized. More care in the palpation of lymph nodes in their respective situations would result in the presumptive clinical diagnosis of the disease, the final diagnosis then being made from examination of the blood smear and by performance of the heterophile agglutination test.

The changes in the lymph nodes have not been studied very extensively, although the pathology has recently been put on a firmer basis by the publication of Downey and Stasney (*Folia haemat* 54 417, 1936). These observers point out that although occasionally the node resembles the picture of leukemia, there is never the complete loss of structure

seen in advanced cases of leukemia and there is no invasion of the capsule. The reticulum is generally hyperplastic, with transformation of some of the cells to lymphocytes. The blood picture is the end result of the extreme hyperplasia found in the lymph nodes, and indicates "a reaction that is more or less leukemoid in nature to an infective, toxic, lymphotropic agent."

The nature of the infectious agent has not yet been elucidated. What relation it has to the positive sheep-cell agglutination test has yet to be worked out. Studies continue to be made on this most interesting diagnostic test, which so far has been shown to be positive only in serum sickness and infectious mononucleosis. The work of several groups of investigators indicates that the agglutinins of serum sickness are of a different type than those of glandular fever, and may be absorbed by appropriate substances. Beer (*J Clin Investigation* 15 591, 1936) contributes an important article in which stress is placed on the differential testing of suspected blood serum with the cells from horses, goats and cows, as well as sheep. Methods are outlined for differentiating cases of serum sickness and infectious mononucleosis.

Although it is comforting to obtain a positive agglutination test, the diagnosis should readily be made from the blood picture which shows marked lymphocytosis, extreme variability in the types of lymphocytes with all sorts of large, abnormally shaped and abnormally stained cells, no anemia and no reduction in blood platelets. The latter three criteria are of importance in distinguishing the condition from acute leukemia which shows monotony of leukocytic picture, anemia and reduction in blood platelets. In many mild cases the heterophile test is negative. N. Rosenthal, in a personal communication, states that the test is positive in only about 30 per cent of his cases. Complications are rare. High fever may at times be present, this is usually in association with secondary involvement of nodes with Vincent's infection. In these cases, the intravenous injection of neoarsphenamine in small doses frequently results in a dramatic drop in temperature and reduction in size of the glands. Otherwise, no treatment is necessary and all patients make an uneventful recovery.

AGRAULOCYTOSIS

During the past year, enough data have been accumulated regarding this disease to allow us to write a summary of most of its important aspects.

Etiology. When the disease was first described (1922), and for about ten years thereafter, very little was known about its cause. Infection, a pe-

culiar metabolic disturbance, some endocrine abnormality, and allergy were all implicated. Beginning in 1931, articles began to be written implicating various drugs, principally amidopyrine (Kracke, Madison and Squier). The etiologic relation between amidopyrine and the disease became quite evident from a large series of articles from American and various European sources. Other drugs, notably dinitrophenol, have been implicated. Cases following the use of a drug related to amidopyrine (Novaldin) have recently been reported by Benjamin and Biederman (*J A M A* 107 493, 1936), following cinchophen by Shapiro and Lehman (*Am J M Sc* 192 705, 1936), and following quinine by others. It was naturally brought out that amidopyrine and the various sedative mixtures associated with amidopyrine (Allonal, Peralga, and so forth), although they were being used in enormous amounts, rarely brought about the disease. The possibility of allergy was suggested by several authors. In a study of the various mechanisms involved, Dameshek and Colmes (*J Clin Investigation* 15 85, 1936) subjected 4 patients, who had recovered from the disease, to intensive study. All four when given from 5 to 50 gr (0.3 to 3.2 gm) of amidopyrine by mouth developed severe headaches and malaise, then striking reduction in white cells and granulocytes, and finally necrotic lesions of the mouth, tongue and throat. Patch tests, scratch tests and intradermal tests with amidopyrine solution were all negative, but when the drug was "aged" with blood serum for several days and the resultant mixture injected intradermally, striking skin reactions occurred, the controls being negative. This indicated that a definite allergic condition was present and that there might be a drug-protein linkage such as had been demonstrated for other chemicals by Landsteiner. Not only did skin reactions occur, but 2 of the 3 patients tested promptly developed severe agranulocytosis, although only approximately a few milligrams of amidopyrine had been injected. This definitely and conclusively showed the extreme hypersensitivity, idiosyncrasy or allergy of certain individuals to the drug amidopyrine, and indirectly explained why the great majority of individuals taking it had failed to develop the disease. It was now possible to piece together the physiologic and pathological principles involved.

Pathologic Histology. After preliminary reports by many writers, which were often actually contradictory, a number of reports on the pathologic lesions of the bone marrow were published by different investigators, all of whom agreed on essential particulars. Fitz-Hugh and Krumbhaar coined the term "maturation arrest" to indicate the con-

dition of the marrow at the height of the disease a marrow crowded with primitive white cells which were apparently prevented from maturing or unable to mature to normal polymorphonuclear cells. This report was soon confirmed by Jaffe, by Custer and by Parker, Darling and Jackson. All these authors emphasized that although the peripheral blood was barren of polymorphonuclears, the marrow was crowded with immature leukocytes. Rohr (*Folia haemat* 55 305, 1936) in a comprehensive investigation studied the bone marrow during life and correlated it with the blood picture. He used the method of bone-marrow puncture, and was thus able to make frequent examination during the course of the disease. He also produced agranulocytosis experimentally in several patients by giving them amidopyrine, and observed the bone marrow before and after administration. "Maturation arrest" of the bone-marrow granulocytes developed, and Rohr concluded that this was an anaphylactic reaction, with the bone marrow acting as the "shock organ." Plum (*Ugeskr f Laeger* 98 919, 1936) did the same experiment with 3 patients, and concluded that administration of amidopyrine by mouth to amidopyrine-hypersensitive persons produces an extraordinary severe and protracted inhibitory effect on granulocytogenesis. The reviewer has shown from unpublished data that giving amidopyrine in large doses to a group of normal individuals will induce a reduction in granulocytes and in white cells in about 25 per cent, when the drug is discontinued, a marked increase in leukocytes and in granulocytes usually occurs ("release phenomenon"). All these pieces of evidence indicate quite clearly (1) that certain individuals have developed a hypersensitivity to amidopyrine, (2) that the hypersensitivity is manifested by severe shock to the bone marrow, with particular reference to the production and maturation of the bone-marrow white cells, (3) that, in the presence of maturation arrest of granulocytes, the peripheral blood becomes depleted of polymorphonuclear cells, (4) that after this has gone on for a few days, the effects of agranulocytosis become clinically manifest, with high fever, malaise, prostration and necrotic lesions of the mucous membranes, and (5) that in the absence of granulocytes, secondary sepsis is easily possible, because of the presence normally within the mouth and other parts of the body of bacteria, and so septicemia may develop.

Diagnosis The diagnosis of the typical case is relatively simple. Although marked prostration is present, there is relatively little to show for it beyond the presence of lesions of the gums, throat or other mucous membranes. If petechiae are

present and anemia is marked, it is likely that agranulocytosis is not present, but rather some disease entity in which, although the granulocytes are very much reduced, the bone marrow as a whole is affected and there are anemia and thrombocytopenia as well. This combination of anemia, leukopenia and thrombocytopenia may be caused by aplastic anemia (benzol, arsenic, gold, and so forth), by carcinoma or lymphosarcoma metastasizing widely into the bone marrow, or by leukemia or generalized Hodgkin's disease, which has overrun the marrow. The differential diagnosis of these conditions is best made by bone marrow biopsy, as the reviewer has repeatedly pointed out (Dameshek *Am J M Sc* 190 617, 1935). Agranulocytosis itself is usually associated with only slight if any reduction in the red cells and without reduction in the platelets.

Treatment Although there is a good deal of disagreement among observers, the only consistent therapeutic results which have been obtained have followed the use of certain nucleic-acid derivatives. Chief among these are a mixture of pentose nucleotides (Pentnucleotide) given intramuscularly in 10-cc doses several times daily, and adenine sulfate, given intravenously in 1- to 2-gm doses, dissolved in 50 to 100 cc of normal salt solution. The reviewer prefers the latter medication, because it seems more rapidly effective and its use is not attended by reactions. Within from forty-eight to sixty hours immature granulocytes usually appear in the circulation, to be followed later by an increase in the total leukocyte count. If the diagnosis is delayed, therapy will be ineffective. Jackson and Parker found that 67 per cent of 103 patients recovered, whereas prior to the introduction of this method of therapy the rate of recovery was only from 10 to 25 per cent.

LEUKOSES (LEUKEMIA)

Since the time of Virchow, who in 1847 first described a case of "weisses Blut," the only progress that has been made in this disease has been in the fields of classification and description. Most authorities are agreed upon the malignant neoplastic character of the disease, although an occasional observer discusses its possible infectious or metabolic character.

Wiseman (*Ann Int Med* 9 1303, 1936) in a lengthy and important paper discusses the possible metabolic character of certain cases of lymphatic leukemia from a clinical analysis of various types of lymphoid hyperplasia. After a discussion of normal lymphopoiesis, he takes up the history of the development of our concepts of the lymphoid hyperplasias and divides them into four main types: lymphatic leukemia, lymphatic pseudoleukemia, leukosarcoma and aleukocytemic

(aleukemic) lymphatic leukemia Lymphatic pseudoleukemia is the same pathologically as lymphatic leukemia except that the cells do not get out into the blood stream (are screened out?) Leukosarcoma represents a sarcomatous disorder of lymphoid tissue with the formation of pathologic lymphocytes which get out into the blood stream and give the picture of leukemia Aleukocytemic (aleukemic) lymphatic leukemia is a disorder in which the cells are lost from the blood stream into the tissue spaces and tend to overgrow the blood-forming organs Wiseman concludes that there are two types of lymphatic leukemia a metabolic form which is probably more common and in which the cells are normal in type but do not mature as they normally should, and a neoplastic form which tends to overrun tissues in typically malignant form The concepts of Wiseman are based on much study and observation and although in many respects unorthodox they are worthy of careful consideration

In last year's review, the experimental observations of Furth were discussed These concerned the transmission of leukemia from rat to rat with the production of local neoplasms, leukemia and aleukemic states at will, according to the method of injection utilized Not infrequently one sees clinical sarcoma (either myelosarcoma, lymphosarcoma or reticulum-cell sarcoma) with primitive cells in the blood smear corresponding to the type of tumor This occurs not infrequently in multiple myeloma, which in reality is a tumor of plasma cells Plasma-cell leukemia is occasionally described, as in recent reports by Patek and Castle (*Am J M Sc* 191 788, 1936), Jores and Bruns (*Folia haemat* 55 277, 1936) and Fleischacker and Klima (*Folia haemat* 56 5, 1936) The difference from the pathologist's standpoint between a local tumor composed of blood cells and the diffuse process called leukemia is often indistinguishable The diagnosis of leukemia is thus in reality a clinical one which may indicate a local tumor with metastasizing cells in the blood or a generalized disease without local tumors

Instead of the paradoxical term aleukemic leukemia, Weil, Isch-Wall and Perlès (*Presse Med* 44 41, 1936) suggest the term "cryptoleukemia," which they feel can often be diagnosed by splenic puncture Although this is doubtless quite a simple procedure, the reviewer has hesitated to adopt this test and has instead carried out sternal bone-marrow biopsy In various disorders in which the spleen is involved, much can be learned from study of the marrow

Many case reports of monocytic leukemia continue to be published One of the best of these, with careful descriptions of the postmortem findings and blood picture, is that of Kato (*J Pediat*

8 679, 1936) Kracke and Garver (*Am J M Technol* 2 81, 1936) make some important observations on the diagnosis of leukemia in which the recommendation is made that the physician and not the technician be responsible for the diagnosis The reviewer can confirm Kracke's experience that the primitive cells—histiocytes, myeloblasts, lymphoblasts—of acute leukemia are more often than not called "large mononuclears" or "large lymphocytes," and thus their diagnostic significance is not realized This happens more often with slide smears, which are frequently too thick for the careful study of individual cells, than with smears made with cover slips In cases of leukemia with normal or low leukocyte counts, study of the "buffy coat" of the blood after it has been centrifuged may reveal many primitive cells, difficult to find otherwise

Keilhack (*Folia haemat* 55 406, 1936) reports an interesting case of chronic aleukemic myelosis with hyperproteinemia High blood proteins have heretofore been reported, aside from kala-azar, only in association with plasma-cell tumors (multiple myeloma) Keilhack's report, in which the total protein was 7.43, albumin 1.80 and globulin 5.16 per cent, is the first showing increased globulins in myeloid leukemia There is a possibility, however, that the diagnosis was not correct since the lymph nodes were greatly enlarged, a very unusual finding in this disease Goldhamer and Barney (*J A M A* 107 1041, 1936) report a case of myelogenous leukemia with cutaneous involvement, which is rare in this disease, although much commoner in the chronic lymphoid type (A generalized macular, infiltrative eruption is commonly seen in acute monocytic leukemia)

The treatment of leukemia remains as discouraging as ever The acute types are better given large doses of sedatives and thus made relatively comfortable Transfusions, x-ray therapy and liver extract often distress the patient without modifying the disease in the slightest X-ray treatment in the chronic cases should be given only when it seems essential for the relief of symptoms I have often seen a relatively healthy patient become bedridden because of too meddlesome therapeutics in this direction Too often the blood count and not the patient is treated X-ray therapy, judiciously handled by the radiologist in close collaboration with the internist, is often of great value Spray treatment or total roentgen therapy seems to be the present method of choice with many radiologists It is useful, as Belot (*Strahlentherapie* 56 560, 1936) points out, in disorders which involve the entire organism, and therefore in leukemia In the reviewer's experience, spray treatment has been disappointing H F Friedman (personal communication) states that he has obtained better results

with the use of intensive local dosage given in turn to various areas of the body until the whole body has been covered. Stephens and Lawrence (*Ann Int Med* 9 1488, 1936) report on their experience with Fowler's solution in the treatment of chronic myeloid leukemia. They recommend it as an effective palliative agent comparing favorably with x-ray therapy. It can perhaps be used most advantageously in conjunction with or alternating with irradiation. Where x-ray therapy is not readily available, the drug may well be used, although its effects on the platelets are often disastrous. The reviewer has discarded its use because of the frequency of toxic effects. Middleton, Meyer and Pohle (*Radiology* 26 586, 1936) give their experience with radiotherapy in leukemia, with particular reference to the effect on the basal metabolic rate. The metabolism, which is commonly elevated in chronic lymphoid leukemia, may act as one of the guides in further therapy. The authors stress the necessity for individualization of therapy.

TUMORS OF THE WHITE CELLS

Krumbhaar (*J A M A* 106 286, 1936), for want of a better term,* proposes that a host of conditions, widely dissimilar in morphology and etiology and in many other ways, be called "lymphomatoid diseases" the various leukemias, the various sarcomas, mycosis fungoides, Hodgkin's disease, agranulocytosis, Cooley's anemia, infectious hemolytic anemia, hepatic thrombosis and von Jaksch's disease. Although this conception may rightly be criticized, the article deserves careful reading, because many apparently unrelated conditions are brought together and discussed in a manner both philosophic and profitable. His classification of "primary myelogenous, lymphocytic and reticular disorders" is quite in keeping with the classifications which have been offered in these reviews in the past two years. Thus there are three blood-forming tissues: bone marrow, lymphoid tissue, and reticuloendothelium. All may be subject to generalized (leukemic) or localized (sarcomatous), leukemic or aleukemic, processes, or to combinations of these. This sort of classification is more in line with the statement which Krumbhaar quotes James Ewing as making in 1927: "Although we may not be able to find clear differences in all cases, how are we going to make progress by throwing them all into one category? I should rather see the most minute differences emphasized and a classification based upon these, until the time when the etiologic factors unify or subdivide the entire group." For

the tumors of the blood cells, as simple a classification as any is that given in last year's review. This may be repeated here:

TISSUE	HIGHLY MALIGNANT	LESS MALIGNANT
Bone marrow	Myelosarcoma (chloroma)	Myeloma (not multiple myeloma)
Lymphoid tissue	Lymphosarcoma	Lymphoma Plasmacytoma (multiple myeloma)
Reticulo-endothelium	Reticulum-cell sarcoma Hodgkin's disease.	Reticulo-endothelioma

Jackson, Parker and Brues (*Am J M Sc* 191 1, 1936) describe under the Boston term of "malignant lymphoma" of the tonsil 37 cases, including reticulum-cell sarcoma, lymphocytoma, Hodgkin's disease, lymphosarcoma, giant-follicle lymphoma and plasmacytoma. The progress of these cases is extremely variable and unpredictable, although it is practically always downhill to death. The number of mitoses per oil-immersion field gave some general indication of the progress. Thus, the patients with ten mitoses per oil-immersion field died in less than six months, those with an average of one or less died in three years or over. The authors warn against the deceptive character of the initial radiosensitivity to x-ray therapy.

Hodgkin's Disease The tendency is more and more to group this disease among the proliferative lesions of the reticuloendothelial system. Although the disease usually originates in the lymph nodes, it is not necessarily a disorder of lymphoid tissue per se, since the lymph nodes contain two widely different types of cells: lymphocytes and reticulum cells. The latter cells differ histologically and functionally from the lymphocytes, and make up, together with similar cells in the bone marrow, the liver and the spleen, the reticuloendothelial system. The reticulum production in Hodgkin's disease and the formation of giant cells are quite characteristic of reticulum-cell rather than lymphocytic proliferation.

Rosenberg and Bloch (*J A M A* 106 1156, 1936) and Goldstein (*Am J M Sc* 191 775, 1936) report their results with the Gordon test in Hodgkin's disease. The test consists briefly in the injection of an emulsion of the suspected lymph node into the brains of rabbits. In a positive reaction the rabbit develops various types of cerebral reactions such as ataxia, spasticity and convulsions. Friedmann in 1934 reported that this test could be obtained with normal bone marrow. Until very recently, the pathogenesis of the test had been unknown. However, in May, 1937, Turner and Jackson (*J Clin Investigation* 16 657, 1937)

*He does not like the terms commonly used in Boston: lymphoblastoma and malignant lymphoma.

showed quite conclusively that the reaction is specific only insofar as the eosinophil is concerned, and will be positive only when eosinophilia is present. Eosinophilia from a variety of conditions will produce the same kind of paralytic action in rabbits. This explains why normal bone marrow with its content of eosinophils gives a positive test and why the fibrotic lymph node of Hodgkin's disease, without eosinophils, gives a negative reaction. Weil, Isch-Wall and Perlès (*Bull et mém Soc med d hop de Paris* 52 1006, 1936) recommend the technic of lymph-node puncture which they have used with excellent diagnostic results in 20 cases. In each instance they controlled their observations with actual biopsy. The principal diagnostic criteria in the puncture material were endothelial elements and authentic giant cells of Sternberg. The reviewer can confirm the simplicity and accuracy of this simple procedure, which might well be generally adopted although for the first year or so it should always be checked with the actual biopsy of a node. The method consists in puncturing an accessible lymph node with an 18 to 20 gauge needle and drawing up a very small amount of material into the needle by the use of suction from a 20-cc syringe. The resultant bits of material are smeared on glass slides which are stained with Wright's or Giemsa stain. Our attention was first drawn to this method by Alfredo Pavlovsky, of Buenos Aires, who has written a monograph on the subject (*Ann d Inst Mun de Rad y Fis Terap* 1 71, 1934). For simple bedside differential diagnosis of lymphosarcoma, Hodgkin's disease, tuberculous adenitis and infectious adenitis the method may be invaluable.

Roth and Watkins (*Ann Int Med* 9 1365, 1936) point out from a study of 40 cases that there is no specific morphologic blood picture diagnostic of Hodgkin's disease. This is quite true. Typical blood pictures are seen only when one knows the diagnosis in advance.

Very little that is new regarding either the diagnosis, pathology or treatment of the disease has been written. An interesting paper is contributed by Ebbehj (*Hospitaltid* 79 253, 1936), who describes minutely the findings in 44 verified cases. In the lungs the disorder may be confused with tuberculosis. The bony system may be involved, generally in the second year of the disease, bony defects are generally the rule, although osteoblastic and sclerosing forms are found. Jacoby, Peirce and Hildreth (*Am J Roentgenol* 36 165, 1936) report on the x-ray treatment of 161 cases within the past decade. Definite

extension of life was induced, as compared with untreated patients, systemic (spray) irradiation was of no greater effect than repeated local treatment, future figures may be better because of improved and more intensive methods of therapy.

HEMORRHAGIC DISEASES (HEMORRHAGIC DIATHESIS)

It is customary to group under the designation of hemorrhagic diathesis a number of disorders in which the only common factor is the tendency to abnormal bleeding. The following classification is offered since it has proved useful in teaching and in the clinic.

- 1 Disturbances of the clotting mechanism
Hemophilia, pseudo-hemophilia, increased coagulation time of jaundice.
- 2 Purpura.
 - a. With deficiency in blood platelets (thrombocytopenic form)
 - (1) Primary, idiopathic or essential
 - (2) Secondary to involvement of bone marrow by a destructive process
Chemical—benzol, arsenic, x-ray, radium, and so forth
Carcinoma and sarcoma
Leukemia.
Gaucher's disease.
 - b. Without deficiency in blood platelets (vascular form)
Anaphylactoid, senile, toxic, nutritional, scorbutic, and so forth.
- 3 Well substantiated vascular defects
Hereditary hemorrhagic telangiectasis, other forms of telangiectasia

Disturbances of the Clotting Mechanism Despite an enormous amount of investigation, little success has been attained in the elucidation of the defective clotting mechanism in hemophilia. Patek and Stetson (*J Clin Investigation* 15 531, 1936) seem, however, to be making progress in this difficult field. These authors state that "the one abnormality constantly found in hemophilia is an inability of the blood to coagulate in a normal manner," a defect demonstrable in the prolonged clotting time. They therefore set out to find what it was that caused this prolongation. It was assumed further that normal blood contains a substance which either supplies a clotting factor lacking from hemophilic blood or which counteracts a mechanism inhibiting coagulation of the blood in hemophilia. The problem was to find this substance, and to do this necessitated the abandonment of many of the previous theoretical concepts regarding the mechanisms of coagulation. The coagulation time as determined by a standard technic was tested in normal and hemophilic blood before and after the use of various test substances. From these tests

these writers conclude that "there is a substance in normal blood which in small quantity effectively reduced the clotting time of hemophilic blood, both in vitro and in vivo, this substance is present in platelet-free plasma and in the plasma of thrombopenic purpura" Further experiments demonstrated that the platelets of hemophilia were normal and that the clotting factor of normal plasma had nothing whatever to do with the platelets or their degradation products Further work along these lines is being carried out The defective substance in the serum is apparently linked up with "prothrombin" and is present in the globulin portion of the blood Patek and Taylor (*Science* 84 271, 1936) continue their investigations in this very important problem

Gray and Ivy (*Am J Digest Dis & Nutrition* 2 368, 1935) studied the serum calcium in cases of jaundice, and found that there was no change in either the diffusible or nondiffusible forms From this they inferred that the calcium metabolism was not responsible for the increased bleeding in jaundice, but that it was probably related directly to the degree of liver damage (This might link up with a fibrinogen defect as postulated by Patek and Stetson, which has been known to be present in severe liver damage) As stated in last year's review, Quick, Brown and Bancroft (*Am J M Sc* 190 501, 1935) set out to find the coagulation defect in cases of jaundice which they thought resided in an alteration in the prothrombin content of the blood Unfortunately they came to no definite conclusion on this point, although their results were suggestive

Transfusion of whole blood or of normal blood plasma is at present the best therapeutic measure we have for hemophilia Patek and Stetson have already demonstrated that relatively small amounts of blood plasma kept at icebox temperature are effective in rapidly shortening the clotting time in cases of hemophilia To forestall bleeding in cases of severe jaundice which necessitate operation, Judd, Snell and Hoerner (*J A M A* 105 1653, 1935) recommend the use of repeated transfusions, preferably before operation Other methods for shortening the clotting time are still being tried Eley, Green and McKhann (*J Pediat* 8 135, 1936) gave an extract of human placenta to 15 children with hemophilia, either orally or by the intramuscular route, 11 cases showed a satisfactory response, with reduction of the clotting time to normal limits Macfarlane (*St Barth Hosp Rep* 68 229, 1935) recommends the use of Russell-viper venom for application locally to stop bleeding in cases of hemophilia This venom was obtained from vipers in the collection of the Zoological Society of London and was effective in clotting

hemophilic blood in a concentration of 1 1,000,000 within six minutes It was used locally on external wounds, or wounds of the gums after dental extractions, with success in 5 of 7 cases Barnett (*Proc Roy Soc Med* 28 1469, 1935) reported similar results with the same venom applied locally in 6 cases of hemophilia These results are similar to those obtained by Rosenfeld and Lenke (*Am J M Sc* 190 779, 1935), who used the venom of the Australian tiger snake, which readily clots 12,800,000 times its weight of heavily citrated or oxalated blood These authors find that tiger-snake venom is superior to Russell-viper venom in many important respects Timperley, Naish and Clark (*Lancet* 2 1142, 1936) report the discovery of a nonprotein substance derived from egg white which when given intravenously to cases of hemophilia shortened the clotting time and stopped further progress of symptoms

Purpura It is possible that bleeding does not occur under the skin in the form of petechiae or ecchymoses unless there is an associated (hypothetical) vascular defect It is also possible that these hypothetical vascular defects may be initiated by the same stimuli which produce the reduction in blood platelets Speculation aside, however, it is usually possible to divide purpura into two main types with and without platelet deficiency

The more one studies *thrombocytopenic purpura* of various types, the more one is disinclined to call anything essential or primary or idiopathic. Causes are rapidly being discovered for the primary anemias of another decade, and the same sort of evolutionary change seems to be developing with thrombocytopenic purpura Thus, in recent years the sedative, Sedormid, has been implicated in an increasing number of cases (Boas and Erf, *New York State J Med* 36 491, 1936, Peck, Rosenthal and Erf, *J A M A* 106 1783, 1936) Neoarsphenamine has again been implicated (Falconer, Epstein and Wever, *Arch Int Med* 58 495, 1936) in 3 cases which developed severe toxic constitutional reactions accompanied by purpura hemorrhagica These authors felt that there was a distinct relation between the nitritoid crises of the arsphenamines and the development of thrombocytopenic purpura hemorrhagica Other drugs which have been incriminated as the probable causes of certain cases of purpura are quinine, chrysarobin, Nirvanol, gold salts and benzene (Cf Patek *Am J M Sc* 191 723, 1936) It is likely that the development of purpura in these cases is in the nature of an allergic reaction, the marrow becoming involved by the "toxic" factor in much the same way as the leukocytes

are involved in agranulocytosis, as previously noted. The observation by the reviewer of a series of 4 cases of thrombocytopenic purpura following major operative procedures leads to speculation concerning the possible role of the barbiturate preparations that are so widely used for preoperative medication.

Despite observation of cases in which an etiologic factor was present, it is conceded that the majority of the cases present no discernible causative mechanism. In those cases occurring usually in girls and developing at about the time of onset of the menstrual cycle, a possible endocrine factor may be postulated. This is strengthened by the fact that in certain cases the platelet count becomes greatly diminished with the menstrual periods. Minot (*Am J M Sc* 192 445, 1936) reports a group of 3 cases occurring periodically with menstruation, and discusses the possibility of an altered endocrine function.

In the idiopathic cases there is a great deal of speculation regarding the mechanisms involved. In common with many authors, Doan, Curtis and Wiseman (*J A M A* 105 1567, 1935) put the significant question "Does the spleen inhibit the formation of platelets in the bone marrow or does it destroy them overly fast?" They do not attempt to answer the question completely, but suggest that the spleen may hold the key position in the so-called hemolytotoeic equilibrium (a term first used by Krumbhaar in 1923). Several investigators have attempted to reproduce the disease experimentally in animals by the use of antiplatelet extracts. Thus, Tocantins (*Arch Path* 21 69, 1936, and *Ann Int Med* 9 838, 1936) induced thrombopenic purpura in dogs by the use of an antiplatelet serum. With the production of a very low platelet count, several tests were performed: bleeding time, clot retraction, tourniquet test, and so forth. The correlation of the level of the platelet count with the bleeding time was not so great as that with the degree of clot retraction*. Filo (*Sang* 10 74, 1936) produced thrombocytopenia in rabbits by the use of a guinea-pig antiplatelet serum. He then studied the bone marrow and found that the megakaryocytes were still present in normal numbers along with various types of nuclear changes. The bleeding time in all the experiments was found to be prolonged. Removing the spleen had no effect on this type of purpura. Kryukof (*Sang* 9 363, 1935) reports a case of thrombocytopenic purpura with bone-marrow biopsy, although there were no platelets

in the peripheral blood, the marrow showed many megakaryocytes.

Although their article is not strictly concerned with purpura but with a careful study of latent and outspoken scurvy, Wright and Lilienfeld (*Arch Int Med* 57 241, 1936) make an important contribution relative to the diagnosis and study of these cases in the form of a standardized tourniquet test (see under "Methods").

With reference to therapy, splenectomy continues to hold its place as a reliable, although radical, form of treatment. Doan, Curtis and Wiseman advance a great deal of clinical data to show the value of this procedure. In a very careful follow-up of 21 cases, 10 splenectomized and 11 treated conservatively by various medical measures, Brown and Elliott (*J A M A* 107 1781, 1936) make the following summary:

In the splenectomized group 80 per cent of the cases were vastly improved or arrested, while the same can be said of only 27 per cent of the control series. It will be seen further that under improved but by no means arrested we find 10 per cent of the operative and 18 per cent of the controls, and that under unimproved or died we find 10 per cent of the splenectomized and 54 per cent of the non splenectomized. In short, we have found three times as many excellent results among the operative group as among the controls, and five times as many poor results among the controls as among the operative group.

Except in the fulminating case requiring emergency splenectomy, it is probably advisable to try the various available medical procedures first. Mettier, Stone and Purviance (*Am J M Sc* 191 794, 1936) treated 7 patients by x-ray therapy over the spleen. In 6 cases the platelet count rose to high limits within twenty-four to forty-eight hours after beginning treatment. The authors cannot explain the mechanism of the reaction, which is usually a transitory and not a curative phenomenon. Moccasin-snake venom is, according to Peck and Rosenthal (*J A M A* 104 1066, 1935), effective in some cases and ineffective in others. Lowenburg and Ginsburg (*J A M A* 106 1779, 1936) produced hypercalcemia in 2 patients (children) by the use of parathyroid extract in dosage of 3 cc (60 units) given daily subcutaneously. Calcium gluconate, 10 cc, was given intramuscularly at the same time. In both cases, the patients developed severe symptoms of hypercalcemia: apathy, lethargy and persistent vomiting associated with a marked increase in the serum calcium. Simultaneously with the development of these symptoms there was a striking diminution in bleeding time, an improved clot retraction and a rise in platelet count. This method deserves further trial. Many writers refer to the use of ascorbic acid (vitamin C). Thus Dreyfus (*Presse med* 44 589, 1936) reports 2 cases in child-

*The bleed n. time is obtained by puncturing the ear with a large bore needle and measuring the time for bleeding to stop. The normal time is one to three minutes; the period increases with diminution in platelets. Retraction of the clot normally occurs in a test tube when blood is allowed to coagulate. With deficiency in platelets the clot retracts very slightly if at all in twenty-four hours.

hood responding to intravenous vitamin C. Many of these reports are uncontrolled and not convincing. In the careful observations of Wright and Lilienfeld there was no improvement in thrombocytopenic purpura following this method of therapy.

Non-thrombocytopenic vascular purpura is apparently caused by a defect of the capillary wall, since the platelets, bleeding time, and clot retraction are all normal. The abnormality of the vessel wall may be due to some well-defined cause such as deficiency in vitamin C or a severe allergic reaction (uremia), or may be completely idiopathic.

The reviewer has seen many women with ecchymotic spots, which usually appear about the time of the menstrual period and which are of no significance. Calcium salts may be of some value in these cases. At times one is faced with the problem of severe postoperative bleeding in a patient whose tests (bleeding time, clotting time, platelet count, and so forth) are all negative but whose tourniquet test may be positive. In these cases it is the reviewer's impression that antivenin (Mulford), given in one dose of 10 cc intramuscularly, followed by moccasin-snake venom in rapidly increasing doses, is of distinct benefit.

371 Commonwealth Avenue.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24011

PRESENTATION OF CASE

First Admission A sixty-two-year-old, white, native-born watchmaker entered the hospital with a complaint of weakness.

Two months before entry he began to feel weak and tired and became slightly dyspneic. He also noticed increasing constipation with change in the character of his stools. About that time he had a single episode of dizziness and almost fainted on two occasions. He took a cathartic and passed a large amount of clotted blood by rectum. Following this he felt quite tired, his dyspnea increased and he had a temperature of 101°F. However, the stools became normal and remained so until the time of entry. Four days after the acute episode he consulted his physician, who told him that his stool gave a 3+ guaiac test and that the red cell count of his blood was 2,500,000. He was sent to a hospital, given a transfusion, and put on a milk and cream diet. X-ray studies at that time were said to show a tumor lying between the bladder and the rectum. He was given a course of x-ray treatment over a six-week period and was told that the tumor was getting progressively smaller. For the two weeks prior to entry to this hospital he had no symptoms except fatigue and dyspnea on exertion. During his illness he had lost 10 lb in weight.

The past history and family history were essentially negative.

Physical examination revealed an emaciated elderly man in no acute discomfort, with dry, lemon-tinted skin. The heart and lungs were negative. The blood pressure was 120 systolic, 80 diastolic. There were bilateral indirect inguinal hernias and undescended testes. The testes could be palpated just external to the inguinal rings. The right testis was slightly tender. On rectal examination the right lobe of the prostate was found to be moderately enlarged, smooth and non-tender. Both lobes were definitely firmer than normal. High on the anterior aspect of the rectal wall there was a hard, irregular, fixed, pelvic mass, measuring about 6 to 8 cm in diameter, which did not descend on "bearing down," as in defecation. No mucosal involvement could be made out, but the examining finger could palpate only the inferior surface of the mass.

The temperature was 98.6°F., the pulse 60. The respirations were 20.

The urine examination was negative. The blood showed a red cell count of 4,360,000 with 75 per cent hemoglobin. The white cell count was 8100, 61 per cent polymorphonuclears. Two guaiac tests on the stools were negative. A blood Hinton test was negative. The blood sugar was 110 mg per cent, and the nonprotein nitrogen 28 mg per cent.

A gastrointestinal x-ray series revealed thickening of the gastric mucosa with elongation of the pyloric valve, but no areas of active ulceration or other lesions could be demonstrated. A barium enema and chest plate were negative.

He was discharged unimproved on the fourth day.

Second Admission (two and a half months later) During the interval he was essentially well, except for a sensation of a mass in his pelvis which he felt in the region of the rectum on sitting down. He had no tarry or bloody stools or change in his bowel habits, and he gained 6 lb in weight.

Physical examination was essentially the same as before, except that the mass felt by rectal examination seemed to be larger. Its growth had been downward into the rectovesical pouch, so that its inferior margin reached the upper border of the prostate. The rectal mucosa overlying it felt edematous but not ulcerated.

The temperature was 99°F., the pulse 65. The respirations were 20.

The urine examination was negative. The blood showed a red cell count of 4,190,000, 75 per cent hemoglobin. The white cell count was 10,900, 82 per cent polymorphonuclears.

On the second day an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. RICHARD H. SWEET This case is one of a sixty-two-year-old man with a relatively short duration of symptoms—two months—starting with a feeling of being weak and tired and then developing slight dyspnea. He noticed increasing constipation and a change in the character of the stools. About that time he had a sudden episode of dizziness and almost fainted on two occasions.

This is a most interesting history. He must certainly have had a massive hemorrhage to account for this episode of dizziness and the passing of clots and the fact that the doctor found the red count so low that it was necessary to transfuse. I think that we also have some evidence of previous hemorrhage, possibly chronic blood loss, from the fact that he was becoming tired and developing dysp-

nea, although it may have been secondary in some other way to the lesion which he developed. From the story we should expect to find that he had a lesion in the stomach or high in the intestinal tract, but the x-ray located it between the bladder and the rectum.

Another interesting feature about this story is the result of the x-ray treatment. A treatment directed over the pelvis produced marked regression in the size of the tumor in a short space of time. There are very few malignant tumors which will do that. The only one I know of is lymphoblastoma. Perhaps Dr Hampton will help on that later. Lymphoma will respond rapidly to x-ray, but how to connect this pelvic mass with his gastrointestinal hemorrhage is the problem.

On physical examination here in the hospital we find that he had lemon-tinted skin, suggesting anemia or possibly malignant disease. I think we can attach no particular significance to the enlarged right lobe of the prostate. It may have been due to benign hypertrophy. There is no note of a proctoscopic examination, which might have helped us in that an ulceration might have been seen.

DR TRACY B MALLORY: Proctoscopy was attempted, but it did not help because the instrument was blocked by the edge of the tumor and the observer was unable to see the mucosa overlying the mass. The rectum below the point of obstruction was normal.

DR SWEET: With this pelvic mass it is curious that the barium enema was negative, and if we are going to assume that he had a gastric lesion and a pelvic mass we ought to find something by x-ray in the stomach. If he had a carcinoma of the stomach and a secondary pelvic tumor,— a gravitating one, if you wish to call it that,— from cancer, the tumor in the stomach ought to be obvious.

X-RAY INTERPRETATION

DR AUBREY O HAMPTON: When were the x-ray treatments given?

DR MALLORY: Before he came in.

DR HAMPTON: I cannot find the mass in this film though there is something wrong with the rectum. It is a small displaced rectum. It is as small as the sigmoid, with no ampulla, and in the upper end where a loop of sigmoid crosses it there seems to be a defect. But on this film, which I assume to be a local view of that area, I do not see any defect. The wall of the rectum looks flat and rather rigid. I have a feeling that this is a defect, but it is not very plain. I could only guess that he might have an intrinsic lesion of his rectum. This other lesion in the duodenum or pyloric valve looks like an ulcer of the base of the duodenum at the distal margin of the valve. It

does not appear to be active. The pyloric valve is long and thread-like and the duodenum shows an irregularity across the base. There is a little projection in the base of the cap that interests me. I think probably you can say that he had a duodenal peptic ulcer which has healed.

DR SWEET: What portion of the duodenum would you say it was in?

DR HAMPTON: I should say in the first portion of the duodenum, near the valve, although I am not too sure.

DIFFERENTIAL DIAGNOSIS (CONTINUED)

DR SWEET: Dr Hampton has helped us considerably because I have a feeling now that the pelvic mass and the gastric lesion are not connected. When I read the history I thought that I should try to make some connection between these two lesions. We can assume that he had a scarred duodenum from an old healed ulcer. I think we can very readily assume that the pelvic mass is not associated with it.

Whether the massive hemorrhage was from high in the gastrointestinal tract or from the colon is not quite so easy to decide, because it seems from the history to have been old blood. It may very well have been blood which accumulated in the colon from an ulceration in the colon itself and then passed when he took the cathartic. I presume, though, if it were old blood, it should have been from higher in the intestinal tract. Unless this ulcer of the duodenum was on the posterior wall it is unlikely that it was the source of a massive hemorrhage. I do not recall ever having seen duodenal ulcers that were not posterior cause a hemorrhage severe enough to make a man faint and lose that much blood. If he had an ulcer we can be sure it was healed and not an active posterior-wall ulcer.

I think we must assume that he had a massive hemorrhage from the mass which was found in the pelvis. This mass was felt by rectum, but they did not see a lesion. That is not surprising because it is quite possible to have a mass in the sigmoid which cannot be seen or only the lower edge of which can be seen. The rectal mucosa seemed to be normal. It is possible to feel and with a proctoscope to see a bulging caused by a mass in another portion of bowel, in other words, from the rectosigmoid one can often feel or indirectly see a mass in a loop which lies against the portion which you are examining. At any rate, this mass was next to the rectum and probably involved the rectosigmoid or sigmoid, and I should say that it was probably the source of the hemorrhage. In my experience, carcinoma of the colon is not very apt to act this way. Massive hemorrhages into

the rectum or colon from a carcinoma are very unusual. They are unusual in the stomach, although this summer I had a patient with massive gastric hemorrhage who had carcinoma. The tumor of the gastrointestinal tract that is most apt to cause hemorrhage of this sort is lymphoblastoma. So, having had the assurance of the x-ray report, I think we can conclude that the lesion for which they operated was a lesion in the pelvis which probably involved the colon. Whether it started there or not, I am not certain, but I will guess that it was a tumor of the lymphoma series.

DR WILLIAM B BREED: Why do you rule out so quickly the duodenum as a source of the hemorrhage? He might have bled two months previously and the lesion healed by this time.

DR SWEET: I thought of that when I read the note about his coming in relatively soon. It was a matter of several weeks.

DR BREED: It was two months.

DR SWEET: I assumed that the duodenum would not look so scarred and contracted if the ulcer were associated with hemorrhage, moreover I am not sure where the ulcer is. I do not feel very enthusiastic about making a diagnosis of massive hemorrhage from duodenal ulcer unless it is on the posterior wall.

CLINICAL DISCUSSION

DR HORACE K. SOWLES: What is the chance of tumor of one of the undescended testicles?

DR MALLORY: They were undescended but were felt and seemed to be normal.

DR WYMAN RICHARDSON: I am not sure that the idea of carcinoma of the stomach with metastases to the pelvis is not worth thinking of a little more.

DR SWEET: I thought of that first, but cast it out.

A PHYSICIAN: Does anyone know how much treatment he had by x-ray?

DR MALLORY: No. Moreover, we have only the statement that he had been told that the mass decreased in size, we have no objective proof.

DR REGINALD H SMITHWICK: This was a very puzzling case to me. I was rather inclined to explain the hemorrhage on the basis of the lesion in the duodenum because the pelvic mass definitely seemed to be extrinsic so far as the rectum itself was concerned. It lay in the pelvis just above the prostate and felt very much as do the retroperitoneal gravitating masses that Dr Sweet mentioned. The persistently negative guaiacs in the stools and our inability to demonstrate ulceration by proctoscope, although examination was unsatisfactory, made me feel that he probably had a lymphoma of some sort which did not necessarily

extend through the wall of the rectum. On exploration we found a mass the size of one's fist lying in the bottom of the pelvis and completely filling it. It was very firmly fixed. The rectosigmoid was densely adherent to it, and one loop of small intestine was knuckled down into it. It seemed at first inoperable. A biopsy was taken and Dr Castleman reported a malignant but slowly growing tumor, definitely not lymphoma. For that reason it seemed worthwhile to try to take it out. All the pelvic peritoneum was removed, together with the mass, separating both ureters from it over a distance of 10 cm on each side. The tumor was adherent to the prostate and bladder, and was separated from them. His rectosigmoid was quite adherent to the mass, chiefly in the mesenteric portion, however, so that one leaf of the mesentery could be removed without destroying the blood supply to the large intestine. It was finally obvious that the growth arose in the loop of small intestine which knuckled into the tumor. This was resected and on opening the specimen, a 2 cm ulcer was found in the wall of the intestine, opening into a cavity about the size of one's thumb which projected into the center of the tumor. On further inspection that loop of small intestine was found to be about in the middle of the intestinal tract. He had no metastases, and a very cursory exploration of the stomach and duodenum failed to reveal evidence of any lesion.

PREOPERATIVE DIAGNOSIS

Retroperitoneal lymphoma

DR SWEET'S DIAGNOSIS

Lymphoma involving the rectum

ANATOMIC DIAGNOSIS

Neurogenic fibrosarcoma of the ileum

PATHOLOGICAL DISCUSSION

DR MALLORY: The tumor we received was a roughly spherical one, fairly completely surrounding a loop of the ileum. As Dr Smithwick told you, it had a deep crater-like cavity in the center. On microscopic examination it was a spindle-cell sarcoma growing at a moderate rate of speed. There were some mitotic figures, and occasional though not very many mononuclear cells. I should say it was of neural origin. Grossly it closely resembled the leiomyomas or leiomyosarcomas that we see in the stomach where deep shaggy craters develop in the center of the tumor. The prognosis in this case is somewhat difficult to make, but I think it is perfectly possible that he may have been cured.

DR HAMPTON: I remember this case now. A

six hour examination was done. The bowel was examined and nothing was found. Furthermore, he was treated with 3000 r, which is about twice as much as you would ordinarily give to lymphoma, so that the tumor responded to quite heavy radiation rather than to a lymphoma dose.

CASE 24012

PRESENTATION OF CASE

A fifty-eight-year-old American housewife was admitted complaining of increasing generalized edema of two years' duration.

Fifteen years before entry she noticed dyspnea on exertion and began using two pillows at night. About twelve years before entry an oculist examined her and advised her to see a physician, who told her that she had "pus in her kidneys." He treated her with "nephritis" tablets and put her on a diet consisting of beef, lettuce and hot water, which she followed for eight months. She improved somewhat under this regime and for the next seven years was quite well except for weakness. About five years before entry she began to notice urinary frequency and nocturia which persisted without dysuria or hematuria. About that time she had an attack of terrific precordial pain which radiated to the back, left shoulder and left arm and was accompanied by a feeling of choking, palpitation and irregular beating of the heart. The attack was relieved by complete rest, nitroglycerin and morphine. In the succeeding five years she had five similar attacks, none of which were related to exertion or any other circumstance. Four years before entry she suddenly developed paralysis of the entire right side of her body with dysphagia and dysarthria. The condition cleared up completely in the course of a few months. She was told at that time that she had a blood pressure of 260. In the next two years her dyspnea and weakness gradually increased until she was unable to do all her housework. Two years before entry she first noticed swelling of her ankles. This edema gradually spread up her body, and even her face became puffy, although no edema of the eyelids was noticed. Ten months before entry she had become so dyspneic that she was no longer able to lie flat in bed, and for the five months before entry she had to sleep in an armchair. The legs became immense because of edema and she gained 50 lb in weight in spite of treatment with two tablets of digitalis daily, frequent injections of salyrgan and a very much restricted fluid intake. Shortly before entry the skin of her legs cracked and began oozing fluid. She had recently noticed some blurring of vision.

She had no hemoptysis, headache, nosebleeds or

other significant symptoms except as noted above. Since childhood she had had mild asthmatic attacks, chiefly in the summer, which had largely disappeared about ten years before entry. About that time she had an attack of pain, swelling and tenderness of both knee joints, which was treated with braces, bandages and special shoes and cleared up after two months. Eight years before entry she developed pain and tenderness in the left flank associated with a tender, palpable mass which was demonstrated by x-ray. A laparotomy was done at an outside hospital and she was told that a large displaced liver had been pushed back into normal position.

The family history was essentially negative except for one stillbirth. She had three normal children.

Physical examination revealed a huge woman sitting upright in bed, breathing somewhat rapidly but not showing cyanosis. There was very marked edema of the feet, legs, abdominal wall and sacral region, slight edema of the hands, but no edema of the face. On both tibiae there were red, non-indurated, excoriated areas oozing clear fluid. The fundi showed very marked tortuosity and narrowing of the arteries with arteriovenous nicking and many exudative areas. There was no papilledema or fresh hemorrhages. The veins of the neck and chest wall were slightly dilated. The pulse was very irregular, and the blood pressure was 158 systolic, 110 diastolic. The heart was enlarged both to the right and left, the sounds were of good quality, and a soft systolic murmur could be heard over the pulmonic area. The lungs had many crackling rales at the left base and a few at the right base. There was very marked ascites, and the liver edge was slightly tender and palpable two fingerbreadths below the costal margin.

The temperature was 98°F, the pulse 84. The respirations were 28.

The urine had a specific gravity of 1.030, and contained a large trace of albumin, with 5 to 10 red blood cells and 20 to 30 white cells per high-power field and granular casts. The blood showed a red cell count of 4,490,000, 75 per cent hemoglobin. The white cell count was 10,850, 73 per cent polymorphonuclears. The stool gave a 2+guaiac test. A blood Hinton test was negative. The nonprotein nitrogen of the blood serum was 34 mg, the protein 4.8 gm., and the cholesterol 175 mg per cent. The Takata-Ara test was negative. The van den Bergh was normal, indirect. An electrocardiogram showed auricular fibrillation, diphasic T₁ and T₂, upright T₃ and T₄, and moderate left-axis deviation.

An x-ray of the chest showed diffuse prominence of the blood vessels throughout the lung

with diminished radiance at both bases but no appreciable amount of pleural fluid. The heart was grossly enlarged, chiefly across the base, and the aorta showed calcification.

She was fully digitalized and given four injections of salyrgan at two-day intervals. This caused a good diuresis, and after a week in the hospital most of the ascites had disappeared. Southey tubes were put in her legs on the eighth day. On the tenth day she died quietly in her sleep.

DIFFERENTIAL DIAGNOSIS

DR R. EARLE GLENDY. In considering this case it is evident from the history that some cardiovascular disease had been present for about fifteen years and had progressed insidiously for most of that time until her death. Dyspnea on effort and orthopnea were first noted fifteen years before her admission to the hospital, no doubt indicating impairment of her myocardial reserve. Subsequently, at the age of forty-six, an examination of her eyes revealed what we may presume to be vascular changes in the fundi, for she was placed on a "nephritic" regime. The improvement that followed was probably due to dietary restriction. There is no record of her blood pressure when first seen by a physician, but in light of subsequent events it is probably safe to surmise that it was high and had been for some time.

For five years preceding her death she had urinary frequency and nocturia. This would indicate that her urine was increased in amount and probably of low specific gravity—altogether typical of the form of nephritis in which cardiovascular disturbances are interwoven with renal changes and which might be more properly called a cardiovascular-renal disturbance. In such cases hypertension is almost invariably present, this further suggests an elevation of the blood pressure of some standing.

Among other things, she had six attacks of precordial pain over a period of five years before entry. There is no statement as to the duration of these attacks, but presumably they were longer than the usual attack of angina pectoris, since they required morphine for relief. Of importance, however, is the fact that the attacks were attended by palpitation and irregular heart action which are not characteristic of angina pectoris or coronary thrombosis as we usually encounter them. I should say that these attacks were due to paroxysmal rapid heart action, probably paroxysmal auricular fibrillation, and that this in turn induced angina pectoris. I am sure these attacks would have been given more space in the history if they had been due to coronary thrombosis.

Four years before her death she had a right hemi-

plegia, probably the result of a cerebral hemorrhage, since her blood pressure was found to be 260 at that time. However, if auricular fibrillation was present in paroxysms or constantly at that time this may have been due to embolism. The rapid complete recovery suggests this.

For two years before her death she showed gradually increasing signs of myocardial insufficiency characterized by dyspnea, orthopnea, weakness, increasing edema and finally massive generalized anasarca, in spite of measures usually adequate to control congestive heart failure.

The past history and family history reveal little of importance bearing on the present illness. It would be of interest to know what was displacing her liver—other than hepatic engorgement—at the time of the laparotomy eight years before entry. If this was merely a swollen, displaced liver or spleen it would indicate that her congestion was of much longer standing than the history indicates.

The physical examination shows the picture of extreme congestive heart failure. From its distribution there seems little doubt that the edema was almost entirely cardiac in origin. However, there may have been some superimposed nutritional edema. But we need no other explanation for the degree of her swelling than congestive heart failure. With this degree of failure one would expect rather pronounced cyanosis. Why it is not present, I cannot say. The eyeground changes represent a part of the general cardiovascular-renal disturbance. I have interpreted the slight engorgement of the chest veins as probably a part of the general congestion and not the result of local extraneous pressure on the superior vena cava or one of its branches.

From the single specimen reported one might consider the urinary findings as those of chronic nephritis with edema, but they are also consistent with a state of passive congestion in the kidneys. The absence of nitrogen retention in the blood makes me feel certain of this. Impairment of renal function, however, and perhaps malnutrition, has resulted in a blood protein that is below the threshold of edema. The positive guaiac test is probably due to congestion in the viscera. The electrocardiographic findings are consistent with hypertensive heart disease with perhaps some coronary involvement. A liver function test was apparently done to rule out cirrhosis.

X-rays of the chest show gross cardiac enlargement that is consistent with a long-standing process, aortic calcification and diffuse pulmonary vascular engorgement, indicating the presence of advanced left-sided heart failure as well as right-sided failure, of which there is so much evidence. Her response to treatment was evidently satis-

factory but she died on the tenth day after admission. Her condition, to be sure, required drastic methods, but there is some evidence now, as demonstrated by Dr. Schnitker at the Peter Bent Brigham Hospital, to show that such a rapid diuresis as occurred here may have its harmful effects. His idea, which is supported by some excellent experimental work, is that edema fluid of digitalized patients contains digitalis bodies, and as the fluid is withdrawn from the tissues and body cavities by diuresis to be excreted through the kidneys by way of the blood stream, there is an additional effect upon the heart which may produce digitalis intoxication. I mention this as a possibility here although no evidence is presented to suggest it.

Depending upon one's point of view it seems that this case can be regarded as one of essential hypertension with cardiac, renal and cerebral complications or as one of chronic nephritis without edema (until cardiac edema supervened) with attendant hypertension and its complications. I think the former is more likely. The immediate cause of death was probably massive or multiple pulmonary infarction, possibly coronary thrombosis. I favor the former because with the improvement in the circulation two factors come into play that favor pulmonary infarction: first, with the increased venous return to the heart, congestion in the lungs may increase, favoring intrapulmonary arterial thrombosis; secondly, the dislodging of a thrombus from the deeper veins of the peripheral circulation is likely to occur. A cerebral accident would not cause death so quickly or so silently unless it involved a vital area like the respiratory center. In the presence of long-standing hypertension, dissecting aortic aneurysm may be listed as a possibility, but there is no clinical evidence to support this diagnosis.

I would, therefore, list my diagnoses as follows: essential hypertension, hypertensive and coronary heart disease with marked cardiac enlargement, auricular fibrillation and congestive heart failure, cerebral hemorrhage (four years ago), chronic nephritis (small granular kidney), pulmonary infarction (terminal).

CLINICAL DIAGNOSES

Hypertensive and arteriosclerotic heart disease
Congestive heart failure
Auricular fibrillation

DR. GLENDY'S DIAGNOSES

Essential hypertension
Hypertensive and coronary heart disease with marked cardiac enlargement, auricular fibrillation and congestive heart failure

Cerebral hemorrhage (four years ago)
Chronic nephritis (small granular kidney)
Pulmonary infarction (terminal)

ANATOMIC DIAGNOSES

Cardiac hypertrophy, hypertensive type
Arteriosclerosis, aortic, coronary and cerebral
Chronic passive congestion
Anasarca
Cholelithiasis
Operative wound vaginal hysterectomy

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY: The heart as was expected was found to be greatly hypertrophied, weighing 655 gm. Foci of calcification were present near the bases of both the aortic and mitral valves but they were too circumscribed to have interfered with function. The myocardium showed no significant amount of scarring and the coronaries though markedly calcified showed no significant narrowing.

I was much interested in the lungs at the time of autopsy since they seemed unusually congested and heavy. Cardiac patients very rarely, in my experience, die in an attack of cardiac asthma and for a time I was hopeful that this might be such a case. More careful examination showed, however, that the edema in this case was almost entirely interstitial, not intra-alveolar as it would be in cardiac asthma. Her years of bronchial asthma had left no trace such as chronic bronchitis or emphysema.

The other viscera showed little in gross except severe chronic passive congestion. The kidneys showed moderate arteriolar changes consistent with her hypertension. There was not enough destruction of renal parenchyma to have interfered with renal function.

The brain showed a definite old area of softening about a thrombosed vessel on the left, undoubtedly responsible for the right hemiplegia four years before. There was considerable diffuse degeneration of the white matter bilaterally which was also unquestionably a very chronic lesion. The cerebral vessel showed considerable sclerosis but no fresh thrombosis.

We are left, therefore, with no explanation for her sudden death in spite of a complete and thorough autopsy. Such sudden deaths are seen in patients with patent but sclerotic coronary arteries and are usually called anginal deaths. The findings in this patient are consistent with such a death, but we cannot prove it.

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FREEDOM OF SPEECH WITHIN THE MEDICAL PROFESSION

THERE appears in this issue of the *Journal* a letter which characterizes the Group Health Association, Inc., of Washington, D. C., as "the opening wedge of socialized medicine in the United States" and suggests that the participation in the opening celebration of the association "by one of the Harvard faculty be referred to the Massachusetts Medical Society for whatever action it deems necessary."

As a citizen of the United States, our correspondent has a right to express his personal opinion of the association, to criticize Dr. Richard Cabot's opinion and to ask this *Journal* to publish his opinion. The *Journal*, however, cannot provide the publicity requested without remark-

ing that Dr. Cabot as a citizen of the United States has exactly the same rights. In this we believe our correspondent will agree. Yet, unless we misunderstand him, his letter suggests that as members of the medical profession his rights and Dr. Cabot's are not the same. The evidence against Dr. Cabot as given in the *Washington Herald-Times* of October 31 and submitted to this *Journal* follows:

Prediction that prepayment medical health insurance groups employing salaried doctors would spread throughout the United States was made last night by Evans Clark, of New York, director of the Filene Twentieth Century Fund, at a meeting of HOLC employes and officials of the Federal Home Loan Bank Board at the Mayflower.

The meeting was an inaugural celebration of the new clinic run by the Group Health Association, Inc., made up of employes of the HOLC, and backed, in part, by the Twentieth Century Fund.

* * *

Dr. Richard Cabot, professor of medicine at Harvard University's graduate medical school, described prepayment group health insurance as "better doctoring for less money."

He asserted that group medical practice was "100 times better than private practice, where modern, assembled diagnoses of several doctors' is often impossible."

He added that salaried doctors are more honest than private doctors who often were tempted to perform expensive operations which were unnecessary.

A doctor on a steady salary, sure of his income, is less likely to be tempted to perform expensive but unneeded medical services than a private doctor who has no certainty of income.

The charge is, then, that Dr. Cabot has expressed an opinion concerning the relative quality and cost of medical care provided by different types of medical service and therefore has acted so unethically that disciplinary action should be taken by the Massachusetts Medical Society.

Has not our correspondent in his letter implied a comparison between the relative quality and cost of medical care provided by different types of medical service which is not complimentary to the many physicians now participating in so-called state and institutional medicine?

It seems unlikely that the Massachusetts Medical Society has information that can prove one com-

parison just and the other unjust, and that thus warrants discriminative action

But possibly our correspondent has an ill-defined but definite feeling that physicians and medical organizations other than the American Medical Association should confine their discussion of medical practice and economics to remarks conforming to the ideas expressed by the official representatives of the American Medical Association. Possibly he has in the back of his mind the following report presented by the chairman of the Judicial Council to the House of Delegates of the American Medical Association in 1934

Whereas, The American Medical Association, including 100,000 physicians, is the only democratic body representing the organized profession of this country through delegates regularly elected through county and state medical societies, and

Whereas, Other medical organizations and groups, representing selected groups of specialists, have from time to time issued pronouncements of policies in the field of medical economics and medical practice, which do not represent the views of organized medicine and which purport to guide the medical profession and the public in the administration of medical affairs, and

Whereas, The House of Delegates of the American Medical Association has repeatedly condemned the issuing of such announcements and policies, which seriously embarrass the attempts of this organization to secure adequate care for the health of the American people and to protect the ideals of the medical profession, and

Whereas, The Board of Regents of the American College of Surgeons, assembled in Chicago on Sunday, June 10, promulgated a policy including a prepayment plan for medical care, restricted to so-called 'approved hospitals' to members of the staffs of such hospitals, and to physicians acceptable to such staffs, and

Whereas, This action of the Board of Regents of the American College of Surgeons has been spread to the people of the United States through the public press on the opening day of the annual session of this House of Delegates, therefore, be it

Resolved That the House of Delegates of the American Medical Association express its condemnation of such tactics and of this apparent attempt of the Board of Regents of the American College of Surgeons to dominate and control the nature of medical practice, and be it further

Resolved That the House of Delegates request the Board of Trustees of the American Medical Association and Judicial Council to ask the Board of Regents

of the American College of Surgeons, who are themselves members of the American Medical Association, to explain the reasons for their action and to justify the attempt by this small group within a specialistic organization to legislate for all the medical profession of this country, truly represented only by the American Medical Association

The resolution was adopted and carried unanimously

Our correspondent, knowing that reports made at medical meetings or presented in medical journals become the property of the public press, possibly thought these recommendations condemned free discussion of certain subjects by the profession

Perhaps then the charge is not that Dr Cabot expressed an opinion that was unjust but that he made a pronouncement of opinion within the field of medical economics and medical practice, which does not represent the views of the Massachusetts Medical Society. The case is then clear. The Massachusetts Medical Society may take action against Dr Cabot because his views are so widely held that they threaten the medical economics and practices supported by the Society and therefore they must be suppressed at all cost. Or the Society may decline to act because it is a democratic organization which respects and does not fear the rights of free speech and of minority opinion. In so doing it might remark that experience indicates that respect for these rights is essential for the successful operation of democratic institutions over any but very short periods of time.

SPOTTED FEVER

THE report¹ of two cases of probable spotted fever arising on Cape Cod is of the greatest public-health importance for the New England states. Until 1930 this disease was supposed to be limited to the Western states and the slopes of the Rocky Mountains. Largely through the studies of Rumreich, cases were then discovered in rural communities in Delaware, Maryland, Pennsylvania, North Carolina and the District of Columbia, and since that time studies carried on almost entirely by officers of the United States Public Health

Service have revealed isolated cases of the disease in most of the states on the Eastern seaboard

The cases at the Charles V Chapin Hospital in Providence unquestionably belonged to the Rickettsia group of diseases. Onset, symptoms and clinical course were characteristic, and the rash on one of the patients, still quite clearly apparent when seen by the writer of this editorial, was typical of this group of infections. Unfortunately, it is not possible to make an absolute differential diagnosis of diseases in this group without isolating the virus and studying its reactions and immunologic properties. Some information can be obtained from the Weil-Felix reaction, but in these cases, while the test definitely indicated Rickettsia infection, it was of limited differential value. Blood serums from the cases agglutinated the proteus bacillus OX 19 in dilutions high enough to be characteristic of typhus fever under ordinary circumstances. On the other hand, they also agglutinated the OXK type in high dilution, a phenomenon which usually occurs only in Tsutsugamushi fever but occasionally, though in relatively lower degree, in spotted fever. It is not safe to rely too strictly upon Weil-Felix differentiation, however, because high OX19 agglutinations have been found by Felix in the so-called "Sao Paulo" typhus, though this disease, both by immunologic reaction and tick transmission, is undoubtedly a form of spotted fever. The only method by which positive diagnosis of these cases within the Rickettsia group can be made—namely, isolation of the virus—unfortunately failed, but it is not always possible to obtain infection in guinea pigs injected with blood from such cases, even when the blood is taken at the height of the disease.

The probability that these were cases of spotted fever rather than typhus is assumed from the very definite history of tick bite in both instances. Moreover, neither rats nor fleas were detected in the environment of the patients, and there was no louse infestation.

The importance of these cases from the public-health point of view cannot be exaggerated. Ticks

are plentiful in southern Massachusetts, especially on Cape Cod, and these ticks—*Dermacentor variabilis*—have been shown by Dyer and his associates of the United States Public Health Service to be able to transmit the eastern type of Rocky Mountain spotted fever virus from the larva to the adult. Moreover, Badger, also of the Public Health Service, has traced a case of this variety directly to infected ticks of this species. Since *Dermacentor variabilis* is the ordinary American dog tick, and since it is not unlikely that dogs may remain, for a short time at least, carriers of the virus, the mechanism for endemic spotted fever transmission is well established in this region of Massachusetts.

In an attempt to clear up the situation, ticks and rodents from the neighborhood in East Brewster where the cases originated, were collected and sent to the laboratories of the Harvard Medical School. Unfortunately, the tick season was practically over by the time these collections were made, but a number of specimens both of larvae and adults were injected into guinea pigs. At the same time, transmission experiments were attempted from the brains of something over a dozen meadow and field mice caught in the same region. That meadow mice are susceptible to spotted fever virus has been known since 1934. So far, no definite results have been obtained from the laboratory inoculations, and in view of the large element of chance involved in such surveys, it is quite likely that no results will be obtained.

The fact remains, however, that two cases of unquestionable Rickettsia disease, probably spotted fever, were found to follow tick bite on Cape Cod, where no previous cases had been determined with certainty. The Massachusetts Department of Public Health has already taken an active interest in the situation, and unquestionably from now on there will be a rigid supervision of suspicious fevers of this kind. Machinery for immediate diagnosis and for epidemiologic and laboratory study is available.

REFERENCE

- 1 McLaughlin, E. A., and Grover, M. L. Rocky Mountain spotted fever in Rhode Island. *Rhode Island M. J.* 20: 159, 1957.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS
AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
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Boston

CASE HISTORY No 53 PARTIAL SEPARATION
OF PLACENTA AT TERM

Mrs J K., a white primipara, aged twenty-nine years, at term, was awakened in bed by a sharp abdominal pain on April 6, 1935. The pain was extremely severe and was followed in ten minutes by a profuse hemorrhage which literally soaked the bed. She had had no previous staining. The patient was advised to enter the hospital.

The family history was negative. There was no history of tuberculosis, diabetes, malignancy or hemorrhagic disease. Her past history was negative. There had been no operations. Her catamenia had been normal with a twenty-eight-day cycle, the last one on June 26, 1934.

She was first seen on November 12, 1934, when five and a half months pregnant. She had had very little nausea and no vomiting. Except for constipation she had no complaints. Physical examination showed a well-nourished and developed woman. Her teeth were in good condition. The throat was negative except for a small amount of tonsillar tissue. The heart was not enlarged, there were no murmurs. The blood pressure was 118 systolic, 70 diastolic. The lungs were clear and resonant, there were no rales. The abdomen showed a palpable mass extending almost to the umbilicus. Neither kidney could be palpated. There was no abdominal spasm or tenderness. Her pelvic measurements were within normal limits. Vaginal examination revealed a nulliparous perineum, a soft but not patulous cervix and a uterus enlarged to the size of a five months' pregnancy. The outlet was ample. At the first visit, urinalysis showed no albumin, and subsequent urinalyses were normal. Her blood pressure at routine visits never went above 120 systolic, 80 diastolic.

On arrival at the hospital the patient was very pale and flowing profusely. The systolic blood pressure on arrival was 100 and dropped to 70 fifteen minutes later. The diastolic blood pressure was not recorded. The pulse rate was 60

but very weak. The membranes had ruptured. The uterus was definitely hard and tender. The fetal heart could be distinctly heard and was of good quality. The patient was conscious and having severe pain. She undoubtedly was in shock and suffering from acute hemorrhage. A compatible donor was obtained. A diagnosis of separated placenta was made because of the hardness and tenderness of the uterus. Intravenous glucose solution was started immediately while the operating room was being prepared. A classical cesarian section was done, and a male child was delivered who cried immediately. The placenta was removed and showed that one third of the placental area was the seat of separation. Several large clots were lying free in the uterine cavity and were removed. The uterus was of normal color and consistence and contracted well after the intravenous injection of pituitrin. There was no discoloration or other indication for removal of the uterus. Transfusion was started as soon as the baby was born, and 500 cc of blood were administered by the citrate method. Following the transfusion, the patient's color was good, the pulse was 80 per minute, and the blood pressure 100 systolic. The uterus continued to act well with normal flowing from below. The patient made an uneventful convalescence.

Comment. This case is a good example of the nontoxic and nontraumatic type of premature partial separation of the placenta. It differs from cases of completely separated placenta in that the amount of external bleeding is usually extremely large. No definite etiology could be discovered, and there was no warning of the impending disaster. Time is a most important element in these cases. In two hours from the onset of symptoms and one hour from entry into the hospital the patient has been operated on and transfused. A longer delay would undoubtedly have lost the child and would have endangered the life of the mother. This patient was a primipara not in labor, and the fetal heart was of good quality on admission. These factors added to the free bleeding made cesarian section the logical treatment. The Dublin method of rupturing the membranes, followed by packing the cervix and using a Spanish windlass, is applicable to cases of separated placenta when the baby is dead or not viable or the mother in profound shock. Prompt and repeated transfusions, if necessary, are essential. The question of removing the uterus in cases of completely separated placenta in which cesarian section is performed is answered at operation by the condition of the uterus. If this is mottled, soft and friable, it is wisest to do a hysterectomy.

ADDITIONAL APPLICATIONS FOR FELLOWSHIP

The following is a list of applications for fellowship which were received too late for publication prior to the meeting of the Board of Censors on November 4, 1937. It is the intention to present these names to the Council at the meeting on February 2, 1938, for final confirmation.

ESSEX NORTH DISTRICT

Kay, Julius—Lawrence General Hospital, Lawrence
Tufts College Medical School, 1937

Submitted by Elmer S Bagnall, *Secretary*

ESSEX SOUTH DISTRICT

Freedberg, Alan Phillips—360 Essex Street, Salem
Boston University School of Medicine, 1935

Hobbs, Wayne—1 Prescott Road, Lynn
Harvard Medical School, 1935

Submitted by Ralph E Stone, *Secretary*

SUFFOLK DISTRICT

Higgins, Francis Henry—Boston City Hospital, Boston
Harvard Medical School, 1934

Hurwitz, Alfred—Beth Israel Hospital, Boston.
Johns Hopkins University School of Medicine, 1933

O'Brien, Francis Robert—Boston City Hospital, Boston.
Tufts College Medical School, 1935

Submitted by John P Monks, *Secretary*

MISCELLANY

NEW MEDICAL DIRECTOR AT WOODSIDE COTTAGES

Dr Arthur H Ward, of Winchendon and Cambridge, will become medical director of Woodside Cottages, Framingham, on January 15, replacing Dr Franklin C. Southworth, who has resigned to take a position with the Buffalo City Hospital.

After graduating from Tufts College Medical School Dr Ward interned at the Cambridge Hospital. Following several years of general practice, he received his special training at the McLean Hospital and the New York Neurological and Psychiatric Institute, later serving as assistant to the late Dr Frank K. Hallock at Cromwell Hall for a period of six years.

Since 1933 Dr Ward has been in private practice with an office in Cambridge, at the same time conducting a small sanatorium for individual treatment of the psychoneuroses at Winchendon, and also serving on the staff of the Boston Dispensary. In addition to the State and county medical societies, he is a member of the American Psychiatric Association, the New England Society of Psychiatry and the Boston Society of Psychiatry and Neurology.

SOCIAL HYGIENE DAY

National Social Hygiene Day, the second observance of which has been set for February 2 by the American Social Hygiene Association, marks the high point in the year-round effort to gain popular interest and support for the activities of the health authorities and the medical profession in dealing with syphilis and gonorrhea. Interested official and voluntary agencies concentrate their efforts at

this time on giving the subject the widest possible publicity, by arranging for meetings of interested groups, press stories and comment, appropriate radio broadcasts, and the like.

The first National Social Hygiene Day, February 3, 1937, was an immediate success in accomplishing its purpose. It was marked by hundreds of meetings held throughout the country. More than a thousand newspaper clippings coming from all parts of the country testify to a uniformly favorable press.

Stamp Out Syphilis—Enemy of Youth is the slogan for the 1938 meetings. Particular emphasis will be laid on the control of syphilis among the twenty- to thirty year age group, in which more than half of all new infections occur.

Suggestions for meetings and practical community programs may be obtained from the American Social Hygiene Association, 50 West 50th Street, New York City. The association will be glad to supply interested persons and groups with materials, such as exhibits, films and literature.

PHYSICIANS ORGANIZATION IN THE COMMUNITY FUND CAMPAIGN

The organization of the physicians' group in Greater Boston's 1938 Community Fund Campaign has now been completed under the chairmanship of Dr Thomas R. Goethals. These workers total 107, and have been divided into ten groups each under a vice-chairman. The campaign opens Monday, January 24, and continues for a period of about two weeks, ending on February 8. The complete list of workers is as follows:

Thomas R. Goethals, chairman, (Mrs.) H. Bell, secretary.

Theodore L. Badger, vice-chairman. Committeemen: Marshall K. Bartlett, James M. Faulkner, Henry H. Faxon, John R. Frazee, Robert L. Goodale, J. Everts Greene, Ward I. Gregg, R. E. Mabrey, Michael E. Murray, Charles E. Short, Richard G. Whiting.

William B. Breed, vice-chairman. Committeemen: John W. Cass, Jr., Edwin F. Cave, A. W. Contratto, E. M. Daland, Hyman Green, A. D. Ludwig, G. Marks, Paul L. Norton, H. D. Stebbins, J. S. Sullman, Milton S. Thompson.

Joseph H. Burnett, vice-chairman. Committeemen: Charles H. Bradford, Virgil G. Casten, Edward J. Cotter, Allan L. Davis, Hugh C. Donahue, Henry E. Groden, Edward Harding, Edgar M. Holmes, Frederick J. Lynch, Abraham Myerson, Francis Rouillard.

Paul A. Chandler, vice-chairman. Committeemen: William G. Barrett, Richard Chute, Eugene C. Eppinger, John V. Leech, Alexander S. MacMillan, H. B. Nelson, John L. Newell, Fred A. Simmons, John W. Strieder.

Stewart H. Clifford, vice-chairman. Committeemen: Geoffrey Edsall, Henry E. Gallup, William T. Green, T. D. Jones, F. W. Marlow, Jr., Edward C. Vogt.

Trygve Gundersen, vice-chairman. Committeemen: William P. Beetham, Harry Blotner, Mahlon T. Easton, John M. Flynn, R. Earle Glendy, Allen P. Joslin, Alexander Marble, Leroy E. Parkins, Francis L. Weille.

Francis C. Neyton, vice-chairman. Committeemen: E. S. Emery, Jr., Marshall N. Fulton, Gerald Hoeffel, John P. Hubbard, H. E. Kennard, H. F. Newton, Henry N. Pratt, M. C. Sosman.

Robert S. Palmer, vice-chairman. Committeemen: Perry C. Baird, Allen G. Brailey, Earle M. Chapman, M. H. Clifford, Neil L. Crone, W. Garrey, A. Graviel Reed.

Harwood, C I Johnson, Lendon Snedeker, Moses J Stone, Claude E Welch, Vernon P Williams

Langdon Parsons, vice-chairman Committeemen F G Balch, Jr, Sidney C Graves, G Douglas Krumbhaar, Jacob Lerman, John P Monks, G S Speare, William B Stevens, George Sturgis, Somers H. Sturgis, C L Swan, Jr, Benjamin Tenney, Jr, Leon E. White, Jr

William T Salter, vice-chairman Committeemen Granville A Bennett, Austin M Brues, J T Edsall, Robert Morison, George van S Smith

RURAL COMMUNITY HOSPITALS

The acute shortage of doctors, hospitals and general medical facilities in many rural areas is brought out in a bulletin on 'Hospitals for Rural Communities' published by the United States Department of Agriculture. The study was made by the Bureau of Agricultural Economics Blanche Halbert, formerly of the bureau staff, is the author.

Noting that well-equipped rural hospitals will encourage doctors to enter country practice, the author says that the shortage of doctors in most small rural communities has become a serious problem. In a number of states where most of the people live in the country, there is only one doctor for every 1000 to 1500 persons. On the other hand, in other states which have a large percentage of urban population, there is one doctor to as few as 500 or 700 persons. The number of doctors in rural territory has been steadily decreasing. A great many small towns that had one or two doctors a few years ago have none at present.

As in the case of the doctors, the situation as to hospital facilities likewise places the rural communities at a great disadvantage. A survey made in 1934 showed that only about 1700 of the 3073 counties in the United States had any general hospital. This means that 1300 counties had no hospitals. By allowing two hospital beds per 1000 population and a distance of 50 miles from hospital centers, the study showed a need for 22,000 new hospital beds for the rural areas.

The hospital need is said to be greatest in the South where more than a million persons living in eight states had less than one hospital bed for every 2000 persons.

The bulletin discusses all the various considerations entering into the planning and building of a rural hospital—the needs of the community, the state laws that affect hospitals and hospital care, what it costs to build and operate a hospital, the financing, and the organization and administration. Numerous sketches show specific plans and specifications, and there are many illustrations of the building and work of rural hospitals in various parts of the country.

Before agreements are made for a new rural hospital, the author points out that some idea of the necessary size and expected occupancy should be obtained, for size affects the capital cost and occupancy affects the operating cost.

The expected occupancy of a hospital is dependent upon the proportion of beds to the population, the health education of the community and the attending physicians' habits of recommending hospital care.

The author concludes. A good rural hospital does more than provide for those in the community who actually need hospital care. If it is well equipped and well organized, it may attract physicians to the country district where it is located and it also may be the means of encouraging the doctors in the locality to stay in country practice. It enables these country doctors to see more patients and do better work. Its laboratories and facilities can be used for the diagnosis and treatment of all people.

It may become the center of the entire county health program."

A copy of the bulletin, No 1792 in the *Farmers' Bulletin* series, may be obtained from the Office of Information, United States Department of Agriculture, Washington, D C

BUCHANAN MEDAL AWARDED TO GENERAL RUSSELL

At the anniversary meeting of the Royal Society at Burlington House, London, on November 30, the Buchanan Medal was awarded to General Frederick F Russell, professor of preventive medicine and hygiene, Harvard Medical School.

After his resignation from the medical corps, U S Army, in 1920 he was appointed a director of the public health laboratory service of the International Health Board, a division of the Rockefeller Foundation, and from 1923 until September 1, 1935, was director of the board. During this period the board contributed generously toward the establishment of schools in hygiene in Europe, India and Singapore. It established a yellow fever unit in West Africa, large grants were made to the Health Section of the League of Nations, and the fellowships sponsored by the International Health Board were materially increased in number and extent. In view of these policies, public health activities throughout the world have greatly increased, and the Buchanan Medal was awarded to General Russell in recognition of his share in formulating and carrying out the projects.

CORRESPONDENCE

GROUP HEALTH ASSOCIATION, INCORPORATED

To the Editor Am enclosing a clipping from a recent issue of one of our local newspapers concerning the opening of Group Health Association, Inc, which I should term the opening wedge of socialized medicine in the United States, with the District of Columbia as the proving ground.

It is my sincere hope that this article be deserving of publication in the *New England Journal of Medicine*, or that the participation in the "celebration" above referred to by one of the Harvard faculty be referred to the Massachusetts Medical Society for whatever action it deems necessary.

A copy of this letter is being sent to Dr Cabot.

C A LALLY, M.D

3800 Cathedral Avenue, N W,
Washington, District of Columbia

UNWISE HASTE

To the Editor This morning's *Springfield Daily Republican* prints 'With his foot jamming, the accelerator against the floorboard and with a siren screeching a warning to motorists, State Trooper Edward J Haughey drove the cruising car which brought Ruth from Pittsfield to the hospital—138 miles—in two hours and forty five minutes.'

Ruth had swallowed a safety pin. So have other children. There is nothing unusual about such mishaps. And very, very rarely is there created thereby any dire emergency. Yet every now and then a case is built up, special

dispensation is granted—by whom one wonders—to break all speed laws, the press is given the news,—again by whom one wonders,—and a mad race is run across the State. Some day innocent but rightful users of the highway are going to be maimed, perhaps killed, in one of these mistakenly heroic rushes.

If there is lacking local talent to handle such mishaps, let the pace abroad be reasonable. It might be well also, before starting, to look near home for an expert. Albany is surely nearer Pittsfield than is Boston, and most likely has a doctor who could have removed Ruth's safety pin. Of course Springfield which was whizzed by is not Boston, but it has half a dozen surgeons who often extract odds and ends from throats, and do it skillfully without, may it be praised, a lot of newspaper notoriety.

ALLEN G. RICE, M.D.

33 School Street,
Springfield, Massachusetts

RECENT DEATHS

EASTMAN—ALEXANDER C. EASTMAN, M.D., formerly of Springfield, Mass., died in Florida, December 23. He was in his sixty third year.

A native of Framingham Center, he was a descendant of New England stock. He attended Worcester Academy, graduated from Amherst College in 1896 and received his degree from Harvard Medical School in 1900. The following year he entered general practice in Framingham. Later he moved to Southboro and from there to Springfield where he became a prominent specialist in children's diseases.

Dr Eastman had served as pediatrician at Mercy and Springfield hospitals, Springfield, president and medical director of the Baby Feeding Association, vice president of the Visiting Nurse Association and president of the New England Pediatric Society.

He was a former fellow of the American Medical Association and the Massachusetts Medical Society. Among his affiliations were memberships in the Springfield Academy of Medicine and the Springfield Medical Association.

His widow, two daughters and a son survive him.

GRANGER—KARLE H. GRANGER, M.D., of South Weymouth, a former fellow of the Massachusetts Medical Society, died December 28 at the Baker Memorial Hospital. He was in his sixty ninth year.

Born in Barnard, Vermont, he graduated from Johns Hopkins University and received his degree from Dartmouth Medical School in 1893.

Dr Granger was a member of the Masonic Order and the Wampatuck Lodge, I O O F.

His widow and a son survive him.

REPORTS OF MEETINGS

NEW ENGLAND OBSTETRICAL AND GYNECOLOGICAL SOCIETY

On December 1, the New England Obstetrical and Gynecological Society held its ninth annual meeting in Boston with headquarters at the University Club.

The morning was occupied by clinics at the Free Hospital for Women in Brookline, and the Boston City Hospital. In the afternoon, clinics were held at the Massachusetts Memorial Hospitals and the Carney Hospital.

The annual dinner took place at the University Club and was attended by the largest number of members which had ever assembled in the history of the organization. The speaker of the evening was Horace Z. Landon, who discussed Modern Germany from a Yankee Viewpoint."

A prize of \$250 which is awarded annually for the best article on either an obstetric or a gynecologic subject was presented to Dr Howard N. Simpson, of the Wesson Maternity Hospital, Springfield, Mass. The title of his essay was "The Role of Venous Pressure in Eclampsia."

BROOKFIELD MEDICAL CLUB

The 555th meeting of the Brookfield Medical Club was held at Ye Olde Tavern in West Brookfield, on Wednesday, December 15, with Dr George A. Moore, of Palmer, host, and Dr William Brady, of Holyoke, speaker, his subject being "The Acute Abdomen."

Two members, Dr Milman Pease, of Brookfield, and Dr Thomas O. Boyle, of North Brookfield, were taken into the club.

The next meeting will be held on January 19, with Dr Charles A. DeLand, of Warren, as host.

JOHN R. FOWLER, M.D., *Secretary*

NOTICES

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, January 18, at 12 o'clock noon.

The speaker will be Dr Ariel W. George, his subject being "Value of X Ray in the Study of Gastrointestinal Lesions." Lantern slides will be used.

All physicians are cordially invited to attend.

JOHN B. HALL, M.D., *Secretary*

NEW ENGLAND HOSPITAL ASSOCIATION

The annual meeting of the New England Hospital Association will be held at the Hotel Statler, Boston, on March 10, 11 and 12.

The meeting will consist of papers on pertinent hospital administration, round table discussions and educational exhibits. Commercial exhibits will be presented in the ballroom of the Hotel Statler.

A. G. ENGELBACH, M.D., *Secretary*

BOSTON CITY HOSPITAL

The monthly clinicopathological conference will be held at the hospital on Wednesday, January 12, at 12 o'clock noon, in the Pathological Amphitheater.

JOSEPH E. HALLISEY, M.D.,
Secretary, Medical Staff

JOINT MEETING OF THE SUFFOLK DISTRICT MEDICAL SOCIETY AND THE BOSTON MEDICAL LIBRARY

There will be a joint meeting of the Suffolk District Medical Society and the Boston Medical Library at the Boston Medical Library, 8 Fenway, on Wednesday, January 19, at 8 15 p. m.

The "Principles and Proposals" will be discussed by the following: Dr Robert B. Osgood, Dr Frank H. Lahey,

Dr Channing Frothingham, Dr Elliott P Joslin, Dr Richard M Smith and Dr Roger I Lee.

JOHN P MONKS, M.D., *Secretary*,
Suffolk District Medical Society

JAMES M FAULKNER, M.D., *Secretary*,
Boston Medical Library

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, January 11, at 8 15 p m.

PROGRAM

Presentation of Cases

The History of the Development of Our Knowledge of Cardiovascular Disease. Dr Paul D White Illustrated with lantern slides

Medical students and physicians are cordially invited to attend

MARSHALL N FULTON, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JANUARY 10

TUESDAY JANUARY 11

- *9 10 a m Boston Dispensary Review of Recent Literature on the Treatment of Malignant Diseases Dr William M Shedden
- 10 30 a m Massachusetts General Hospital Cardiac rounds
- *8 15 p m Harvard Medical Society Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance)

WEDNESDAY JANUARY 12

- 8 a m Massachusetts General Hospital Grand rounds Orthopedic department
- *9 10 a m Boston Dispensary Sulfanilamide in the Treatment of Meningococcic Meningitis Dr Edwin H Place.
- *12 m Clinicopathological conference. Children's Hospital Amphitheater
- 12 m Boston City Hospital clinicopathological conference. Pathological amphitheater

THURSDAY JANUARY 13

- 8 30 a m 9 30 a m Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Peter Bent Brigham Hospital
- 9 a m Massachusetts General Hospital Surgical grand rounds.
- *9 10 a m Boston Dispensary Bleeding from Peptic Ulcer Dr Maurice S Segal
- 9 15 a m Massachusetts General Hospital Neurological conference. Ether Dome
- 12 m Massachusetts General Hospital Clinicopathological conference.

FRIDAY JANUARY 14

- *9 10 a m Boston Dispensary Plasma Fibrinogen and the Sedimentation Test Dr Thomas H Ham
- 10 a m Massachusetts General Hospital Fracture rounds

SATURDAY JANUARY 15

- *9 10 a m Boston Dispensary Hospital Case Presentation Dr Heinz Magendantz
- *10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A Christian

SUNDAY JANUARY 16

- 4 p m Free public lecture Harvard Medical School amphitheater of Building D Cancer Dr Shields Warren

Open to the medical profession

- JANUARY 6—Faulkner Hospital Symposium on Sulfanilamide. 5 p m
- JANUARY 7 14 21—Series of moving pictures at the Boston Dispensary Page 1113 issue of December 30
- JANUARY 9 MARCH 27—Harvard University Free Public Lectures Page 1017 issue of December 16
- JANUARY 11—Harvard Medical Society Notice above
- JANUARY 17—Boston City Hospital Page 51

JANUARY 13—Pentucket Association of Physicians Hotel Bartlett, 95 Main Street Haverhill 8 30 p m

JANUARY 17—Boston Medical History Club 8 15 p m Boston Medical Library

JANUARY 18—South End Medical Club Page 51

FEBRUARY 1—Greater Boston Medical Society Auditorium of the Beth Israel Hospital Boston 8 30 p m

FEBRUARY 2—Second National Social Hygiene Day Page 49

FEBRUARY 14—American Board of Internal Medicine. Page 969 issue of December 9

MARCH 10 11 12—New England Hospital Association Page 51

APRIL 4 8—The American College of Physicians Page 41 issue of July 1

MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

OCTOBER 17 21—Clinical Congress of the American College of Surgeons, New York City

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p m New Bedford

ESSEX SOUTH

FEBRUARY 2—Council Meeting Boston

FEBRUARY 9—Essex Sanatorium Middleton Clinic at 5 p m Dinner at 7 p m Speaker—Dr John B Hawes 2d Subject, Dust and Disease.

MARCH 2—Lynn Hospital Clinic at 5 p m Dinner at 7 p m Speaker and subject to be announced

APRIL 6—Gloucester Hospital Gloucester Clinic at 5 p m Dinner at 7 p m Speaker and subject to be announced.

MAY 5—Censors meet at Salem Hospital 3.30 p m.

MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p m Speaker and subject to be announced

FRANKLIN

Meetings will be held at the Franklin County Hospital Greenfield at 11 a. m the second Tuesdays of January March and May

HAMPDEN

Meetings will be held on the fourth Tuesday in January April and July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club Stoneham at 12 15 p m. on January 12 March 16 and May 11

MIDDLESEX NORTH

Meetings will be held at the Vesper Country Club Lowell on January 26 and April 27

MIDDLESEX SOUTH

JANUARY 19—Page 1113 issue of December 30

NORFOLK DISTRICT

JANUARY 25—Hotel Kenmore. 8 15 p m The Management of Uterine Prolapse Dr Louis E Phaneuf

FEBRUARY 23—Hotel Kenmore. 8 15 p m Dermatitis Venenata Due to Cosmetics and Industrial Irritants Dr John G Dowling Discussion by Dr Francis P McCarthy

MARCH 29—Hotel Kenmore. 8 15 p m. Subject to be announced but to be related to diseases of the kidney Dr Albert A Horner

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon.

FEBRUARY 3—Norfolk County Hospital South Braintree

MARCH 3—Norfolk County Hospital South Braintree.

APRIL 7—At the Quincy City Hospital

MAY 5—Annual Meeting

PLYMOUTH

Meetings will be held at 11 a m on January 20 March 17 April 21 May 19 and July 21

SUFFOLK

JANUARY 19—Joint meeting with Boston Medical Library Page 51

MARCH 15—Joint meeting with Boston Obstetrical Society

WORCESTER

At the following meetings except the annual meeting dinner will be at 6 15 to be followed by business session and scientific program

JANUARY 12—Worcester City Hospital Worcester

FEBRUARY 9—Worcester State Hospital Worcester

MARCH 9—Memorial Hospital Worcester

APRIL 13—Hahnemann Hospital Worcester

MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced

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MASSACHUSETTS MEDICAL SOCIETY

Section of Radiology and Physiotherapy

Presiding

Dr William G Curtis, Wollaston, chairman
Dr Frank E. Wheatley, Milton, secretary

THE CHAIRMAN Our first paper is by Dr Francis P McCarthy His subject is "Physical Modalities in the Treatment of Discrete Superficial Skin Lesions"

PHYSICAL MODALITIES IN THE TREATMENT OF DISCRETE SUPERFICIAL SKIN LESIONS

FRANCIS P MCCARTHY, M.D *

BOSTON

THE use of physical therapeutic modalities in the eradication of superficial skin lesions, with particular reference to benign and malignant growths, has reached a stage where after several years we can more definitely evaluate their effects. Merely to consider the clinical phase of such lesions would be academic and unnecessary, but a knowledge of the histopathologic structure of a given lesion is essential to the intelligent use of physical therapy.

The treatment of many discrete skin lesions such as warts, various types of nevi and even malignant neoplasms is left to every sort of medical and lay practitioner, including the "beautician," the podiatrist, the electrolysis technician and even the barber. When one considers the difficulty of diagnosing many of these lesions even for the dermatologist, trained to interpret such conditions both clinically and histologically, it seems necessary to present a few fundamental facts in order to discourage the indiscriminate use of physical remedies. In discussing the treatment of discrete superficial lesions in the skin and the oral cavity, I shall attempt to indicate the proper modality called for by the clinical and histologic factors in the given case.

In general, it is desirable to note the location, size, color, consistence, depth and morphology of the lesion. If it is fairly large, and the diagnosis cannot be definitely determined, a small biopsy

specimen should be taken and examined histologically. If the lesions are multiple, excision and examination of a single lesion may be desirable. It is not an uncommon practice among the untrained to commence treatment without first determining the character of the growth.

As a pathologist I have been impressed by the frequent use of unnecessarily radical surgical procedures in the removal of simple benign lesions, such as the excision of a large V-shaped wedge of tissue from the lip or tongue for a simple retention mucous cyst. On the other hand, inadequate treatment of a rapidly growing squamous-cell carcinoma may favor metastases to the regional lymph nodes.

Among the physical agents used are the following:

Radium	Electrocautery
Roentgen rays	Actual cautery
Grenz rays	Electrolysis (galvanic current)
High frequency current	Carbon-dioxide snow
Cutting current	Ultraviolet rays
Electrodesiccation	
Electrocoagulation	

High-frequency current and carbon-dioxide snow I have found especially advantageous in the removal of benign and malignant superficial lesions. The use of radium and roentgen rays has been limited to deeper and more extensive lesions, which are not covered in this discussion.

The following tabulation indicates the wide variety of skin lesions which it is essential to recognize in order to apply the proper treatment.^{1 2}

Presented at the annual meeting of the Massachusetts Medical Society, Boston, June 1, 1937.

Professor of oral medicine, Tufts College Dental School.

Verrucae (many different types)	Chondrodermatitis nodularis chronica helices
Keratosis	Clavus
Senile	Fibroma
Leukoplakia	Granuloma pyogenicum
Kraurosis vulvae	Xanthoma
Miscellaneous	Xanthelasma palpebrarum
Nevi	Adenoma sebaceum
Vascular	Retention cysts (mucous)
Solid cellular	Sebaceous cysts
Keloids	Telangiectases
Tuberculides	Molluscum contagiosum
Cicatrices	Basal-cell epithelioma
Multiple benign cystic epitheliomas	Squamous-cell epithelioma
Dermatitis papillaris capillitii (acne keloid)	Melanocarcinoma

There are many other skin lesions in which physical therapeutic measures may be applied

I have selected from the list of cutaneous lesions several for discussion

VERRUCAE

Verruca Vulgaris The common wart occurs at all ages, but more often in the young, and tends to be autoinoculable. The histologic picture presents an entirely epithelial reaction—acanthosis and hyperkeratosis. In older people this lesion is often quite resistant to treatment, and carbon-dioxide snow with electrodesiccation offers the best form of therapy. In young children carbon-dioxide snow is the most desirable method of treatment, pressure is exerted for about twenty seconds, and the procedure is repeated two or three times, depending on the size and consistence of the lesion. Overtreatment is to be avoided, as it causes unnecessary scars.

Verruca Plantaris The plantar wart has become more frequent in recent years than formerly, especially in women, through the wearing of thin-soled shoes, it presents a difficult problem in therapy, especially if only palliative measures are adopted. While x-rays and radium are both extremely useful here, I prefer the electrodesiccating current, with novocain injected deeply under the keratotic central plug of tissue, and with the fractional method of treatment. In some cases a complete removal may be effected at one sitting, but discomfort may be experienced during the healing stage.

Verruca Acuminata This type of new growth may be small or may represent large conglomerate condylomatous lesions. Curettage under local anesthesia before use of high-frequency current is sometimes desirable. Venereal warts are most successfully treated by electrodesic-

cation, although both carbon dioxide snow and electrolysis give good results.

Miscellaneous Warts occur not infrequently on the eyelids, they are usually filiform, and a very slight desiccating current is normally sufficient to eradicate them without scars. Where the scalp is the site of the lesion, care should be exercised not to overtreat, as there is some danger of localized permanent alopecia, although this is a rare occurrence. Recurrences in the scalp are very frequent, and small lesions are readily overlooked. Probably the most obstinate type of wart is that on the bearded portion of the face. It is generally small and flat, or filiform. High-frequency current skillfully applied is usually effective, but scarring is the rule rather than the exception, and recurrences are common as a result of reinoculation from shaving.

KERATOSES

Keratotic lesions may be either primary or secondary, and include precancerous lesions. Clinical experience is essential for their recognition. The seborrheic type is quite common, it usually begins in middle life and involves the face and trunk. The lesions are brownish or almost black, greasy, soft and multiple. There is a marked hyperkeratosis of closely packed horny lamellae, and moderate to marked irregular acanthosis, with a distinct basal layer. There is a nevoid grouping of the epithelial cells, with horn cysts in the epidermis and inflammatory reactions of varying degrees in the upper corium. The lesions are readily removed by carbon-dioxide snow or light electrodesiccation, and no scarring should result. They do not tend toward malignancy, but occasionally give rise to the basal-cell type of lesion.

Keratosis Senilis This is one of the commoner types and occurs principally on the face and the backs of the hands in individuals beyond middle life. The lesion may be indistinguishable from the seborrheic type, but is usually harder and more deeply pigmented. It is serious in nature, as it tends toward malignancy of the squamous-cell type, and often shows an invading ulcerative process beneath the overlying hyperkeratotic and acanthotic epithelial one. Radical destruction is indicated, although a biopsy may be advisable in order to ascertain whether a carcinoma has developed. It is interesting to note that while a squamous-cell epithelioma arising from a lesion on the face above the mouth tends to be locally malignant, those on the lip or neck metastasize to the cervical lymph nodes, especially if they are growing rapidly.

Electrodesiccation in the keratotic stage is in most

cases sufficient, but if the lesion is ulcerated and shows definite induration and ulceration, or if malignancy is present, excision with the cutting current or surgical excision may be necessary. In the treatment of senile keratoses, the resultant scar should not be taken into consideration, for the lesions are often malignant and thorough treatment is indicated.



Figure 1 *Leukoplakia buccalis* (Grade 4)—*verrucous squamous-cell carcinoma*

*Leukoplakia*³ This common hyperkeratotic, acanthotic oral lesion, is graded in four groups, according to its clinical appearance and histopathology.

Grade I is characterized by the initial reaction of the mucous membrane to irritation, indicated by a red, granular, sharply defined and slightly sensitive area which soon becomes whitish gray. The microscopic picture at this stage shows an inflammatory reaction of the corium without definite epithelial proliferation.

Grade II is a very distinct lesion characterized by bluish-white patches or plaques without palpable induration, but sharply outlined from the normal mucosa. They are quadrangular or irregularly polygonal, and seem to be applied to the mucous membrane.

Grade III is very definite and is easily recognized at a glance, even by a layman. It presents a milk-white, pearly or silvery indurated plaque, either localized or covering large areas. The lesion tends to wrinkle, especially if it involves the buccal mucosa. Microscopically the classic picture of marked hyperkeratosis, with acanthosis and cellular reaction of the corium, is seen.

Grade IV is a still more pronounced keratotic lesion, which is indurated and leathery in appear-

ance and displays evidences of malignancy—early erosion, fissuring of the plaque or warty proliferation of the surface. This grade of leukoplakia should be treated as an incipient malignant neoplasm.

In the lesions of leukoplakia, the most striking histologic change occurs in the epithelial layer, especially the horny layer, which is markedly hypertrophied, in many cases the flattened, nucleated, hyperkeratotic epithelium extends clear up to the surface of the specimen. The rete cones are enlarged and broadened, and the malpighian layer is distinctly thickened. In the more advanced stages the hypertrophy of all the epithelial layers, especially the horny layer, is noticeable. Edema of the acanthotic cells may occur, in the early malignant stage the orderly arrangement of the malpighian layer is disturbed, with the formation of atypical cells, and numerous mitoses may be found.



Figure 2 *Leukoplakia buccalis* (Grade 4) Shows marked hyperkeratosis and acanthosis with increased vascularity and cellular infiltration of tunica propria

Underlying the corium is usually a fairly pronounced cellular infiltration, with separation of the collagen fibers and diminution of the elastic fibers.

Except for the preventive measures of removal of the irritating factor in the mouth, together with abstinence from tobacco, the treatment of leukoplakia is unsatisfactory. Where tobacco is a factor and the patient continues to use it, removal is usually followed by a recurrence. Having tried various methods, I have virtually abandoned radium and x-ray in favor of electrodesiccation and electrocoagulation by monopolar and bipolar high-

frequency current. I have not employed the actual cautery, but believe it to be equally effective. I feel that the use of radium for leukoplakia of the tongue associated with atrophic luetic glossitis is provocative of malignancy where the treatment has been given in small doses over a considerable period of time. Malignancy has developed in 2 of my cases following this type of treatment where the radium plaque in 5- or 10-mg doses was used for from twenty minutes to half an hour. Treatments over a period of months ultimately resulted in the development of verrucous carcinomatous lesions. It is advisable in this type of case to stop all smoking, to keep the patient under close supervision and to use monopolar or bipolar electrocoagulation in the destruction of any lesion that tends toward malignancy. Since it is in such cases that multiple malignancies of the tongue develop, great care should be exercised in their examination, and the patient should report every few months. The vast majority of leukoplakias require no treatment and the use of local irritating or caustic remedies is contraindicated, as there is a possibility of stimulating a malignant change.

Kraurosis Vulvae This lesion represents a type of hyperkeratotic lesion that tends toward malignancy more frequently than does leukoplakia buccalis. Destructive desiccation or bipolar coagulation is recommended, or surgical excision in pronounced cases.

Miscellaneous In the miscellaneous group of skin keratoses are those that follow the use of arsenic and are found on the soles and palms. They tend to develop into the squamous-cell type of malignancy, and are best removed by electrodesiccation. Keratoses following x-ray or radium burns often give rise to malignancy and are difficult to treat, due to the underlying fibrosis and avascular tissue, they are apt to ulcerate if destroyed.

NEVI

Birthmarks are quite common and of many varieties, and their differentiation requires considerable diagnostic skill. In describing their treatment it is desirable to point out the various types, with particular reference to the tendency of some of them to become malignant, and to emphasize the necessity of discretion and judgment. More than thirty types have been described, but for the sake of simplicity these may be divided into two broad groups, the vascular and the solid cellular.

Vascular Nevi These are common, particularly in infants and young children, and consist of four varieties—nevus araneus (spider nevus), nevus flammeus (port-wine mark), and two kinds of angioma, the so-called strawberry hemangioma and the cavernous hemangioma.

Nevus araneus is a very superficial hemangioma, showing dilated capillary vessels emanating from a dot-like center. Either the galvanic needle or the high-frequency current may be used, the central spot being touched very lightly with the point of the needle, as a result, the lesion shrivels without leaving a scar.

Port-wine birthmarks are best left alone, especially if they cover extensive areas. Carbon-dioxide snow may blanch them out to a certain degree, but it is very difficult to achieve a uniform blanching, and the mottled effect may in the end present a more objectionable cosmetic effect than the original lesion.



Figure 3 Cavernous hemangioma of tongue

Cavernous hemangiomas are composed of relatively large vessels lined with endothelium, they occur deep in the skin and subcutaneous tissue, and are best treated with radium or x-ray therapy, depending on their size. Carbon-dioxide snow is recommended for small, superficial lesions. With pressure applied for about twenty seconds for three or four times, the lesion gradually shrinks and disappears, leaving a thin, smooth scar. Electrodesiccation and coagulation have also been employed in the treatment of small lesions, but I have found the former method preferable, freezing produces a thrombosis of the vessels, associated with an acute inflammatory reaction and necrosis. Very satisfactory results are obtained with intervals of from two to four weeks between treatments. In superficial vascular nevi of the strawberry

type, pressure treatment, with the water-cooled ultraviolet lamp to produce vesiculation, is very effective, and is comparable in its results to carbon dioxide snow.

Solid Nevus or Moles. Pigmented nevus may be simple, brownish-pigmented lesions, definitely benign in structure and course, or deep black to bluish and dangerous in their potential tendency to malignancy. It is in this class of skin lesions that a

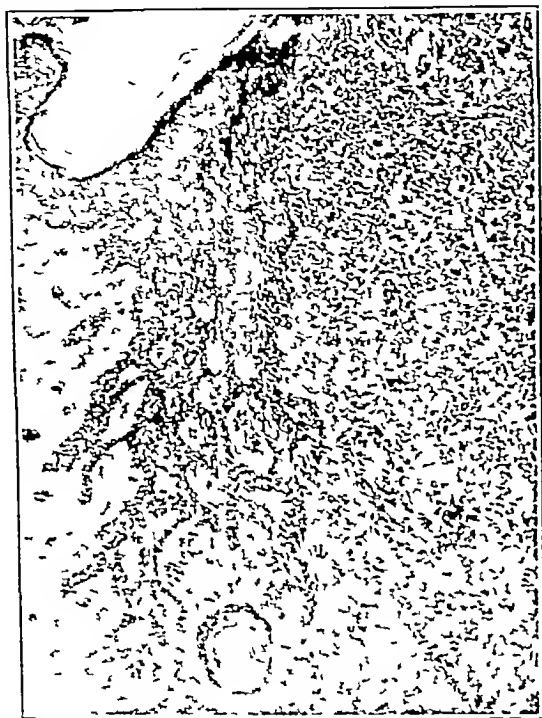


Figure 4 Melanocarcinoma arising from pigmented mole of arm (fatal case)

knowledge of the clinical and histopathological structure is essential in evaluating the proper physical modality.

The common mole is small, oval, smooth, slightly elevated and pale brownish, with or without the growth of hair, it cannot be considered potentially malignant in view of the many millions of seed moles in existence. However, even the most benign mole, if subject to traumatism over a period of years, may take on active growth tendencies and become a malignant neoplasm, with an early tendency to blood-stream metastases.

Blue-black moles are best left alone or removed by wide excision, as the underlying nevus cells may extend a considerable distance from the periphery of the lesion. If situated where chronic irritation may stimulate growth they are especially dangerous, as they frequently take on malignant tendencies with the production of one of the most rapidly growing neoplasms — melanocarcinoma.

MISCELLANEOUS

Keloids. Keloidal growths of tissue represent hypertrophy of the collagen fibers of the corium, and may be spontaneous, or may follow scars from previous trauma or surgical incision. They occur in naturally susceptible individuals, and may even follow simple therapeutic procedures such as the removal of verrucae by electrodesiccation. Negroes and dark-skinned Caucasians have a special tendency toward these lesions. Surgery and electrosurgical therapy are contraindicated, radium for small lesions and roentgen therapy for larger ones give the best results.

Tuberculides. Many of the smaller, more superficial tuberculides may be treated by electrodesiccation with good results, especially if the lesions are discrete and cover extensive areas. The sarcoid



Figure 5 Keloid showing interlacing collagen fibers

of Boeck, verrucous lesions and focal areas, and discoid lupus erythematosus lesions are amenable to the desiccating current. Carbon-dioxide snow also may be utilized in the treatment of lupus vulgaris nodules and in lupus erythematosus. One must not, however, fail to realize that internal medication with the arsenicals, gold compounds and bismuth is applied with beneficial results in cutaneous tuberculosis, and that physical modalities are merely adjuncts in the therapy of these lesions.

Dermatitis Papillaris Capillitii (Acne Keloid). This lesion, usually located at the nape of the neck,

may present a hard problem in therapy. I have found electrodesiccation, followed by radium or roentgen therapy, effective.

Granuloma Pyogenicum This lesion is made up of granulation tissue, richly vascular and very persistent. Electrodesiccation, followed by curettage and further desiccation, generally destroys the

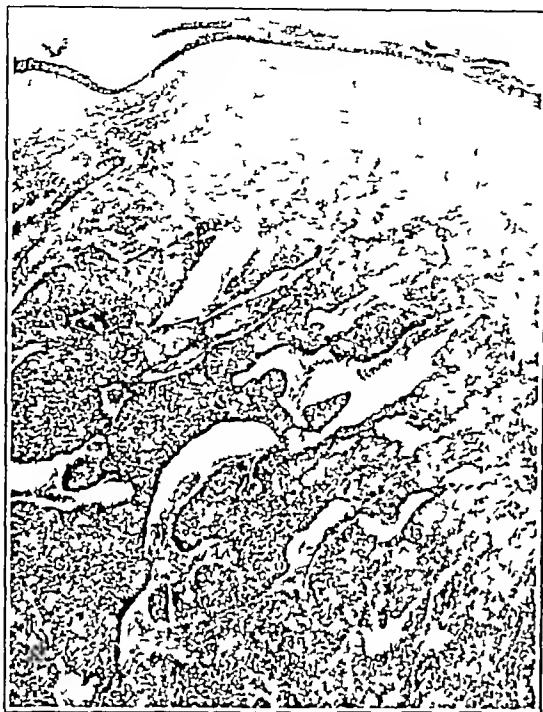


Figure 6 Basal-cell epithelioma of upper lip

lesion, but unless the treatment is thorough a rapid recurrence is the rule.

Xanthoma and Xanthelasma Palpebrarum The smaller lesions of xanthoma tuberosum may be destroyed by electrodesiccation, and excellent results are also obtained by it in xanthelasma of the eyelids. With the latter it is desirable to use a very small spark, as the cells comprising the lesion are highly susceptible to the electrical current, and promptly melt away upon a very light application. It is better to use fractional treatments than a single treatment that may be too severe, as disfiguring scars may be produced.

Retention Cysts Mucous retention cysts of the lips and oral cavity are best treated by electrodesiccation. An initial incision with expression of the contents may be desirable in the larger cyst, followed by the insertion of the electrode and the application of sufficient current to destroy the epithelial lining. Small sebaceous cysts of the skin may be treated along similar lines, but the ideal treatment of the larger cysts is surgical resec-

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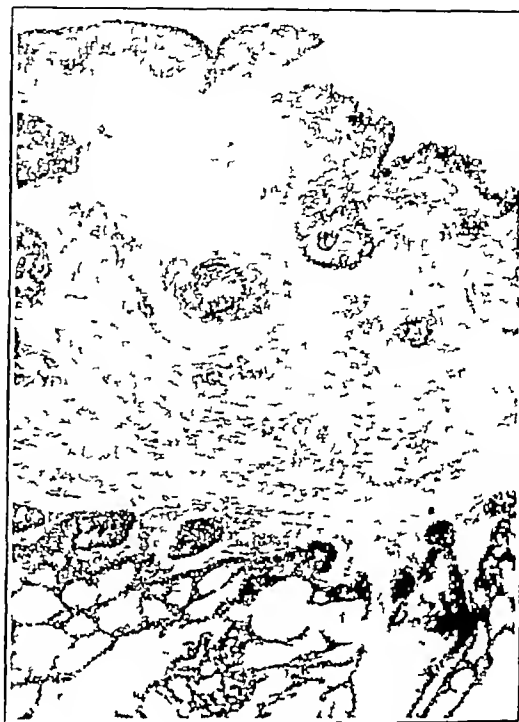


Figure 7 Cystic basal-cell epithelioma (eyelid)
vessels are compensating for the poor circulation in the cicatrix, ulceration may follow if the treatment is too drastic.



Figure 8 Squamous-cell epithelioma of cheek (Grade 1)

Molluscum Contagiosum These lesions represent invaginated dyskeratotic epithelium and are readily shelled out by the curette, desiccation may be applied to the base of the lesion

Basal-Cell Epithelioma The basal-cell tumor is the common malignant lesion of the face, it has a characteristic appearance and can usually be diagnosed clinically without a biopsy. It is locally malignant and does not metastasize to the regional lymph nodes, but a certain percentage of these tumors contain epithelium of the prickle-cell type, in which cases more radical treatment should be applied. I have found electrodesiccation or coagulation the ideal treatment for a large number of these cases, in place of radium and roentgen ray therapy. Often a combination of radiation and electrodesiccation is desirable, and the resulting scar is usually superficial and soft.

Squamous-Cell Epithelioma⁵ The method of choice in the treatment of this type of malignancy is based on each individual case, with special reference to the grade of malignancy, the size and location of the lesion, and the question of metastasis. In early and superficial lesions electrodesiccation or coagulation may be sufficient to destroy the lesion, but more often a combination of electrodesurgery and radiation therapy is required.

SUMMARY

The clinical diagnosis of superficial lesions of the skin and the oral cavity is essential to an intelligent application of the proper physical modality. A knowledge of the histopathology is desirable so as to enable one to "read" the lesion in terms of the actual cellular process. Too often inadequate or too radical procedures are applied in treatment, based on ignorance of the clinical and histologic picture, and occasionally a metastatic, neoplastic process is caused by crude therapeutic methods.

371 Commonwealth Avenue.

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DISCUSSION

THE CHAIRMAN The discussion will be opened by Dr Austin W. Cheever.

DR. ALSTIN W. CHEEVER, Boston Dr. McCarthy does not leave me very much to say, for he has covered the subject very well indeed, however, there are one or two points that come to my mind. One is that I wish there were more control of beauticians. A little while ago, what I supposed was a mole on an eyelid turned out to be melanotic carcinoma. I wonder what would have happened if a beautician had been removing the blemish. With only a galvanic needle, and no radium or diathermy, he might have done irreparable harm.

I think each one has his favorite methods. Some of mine differ from Dr. McCarthy's, for instance, I prefer radium on keratoses and epitheliomas. On plantar warts I like the x-ray best of all. It does not always work, but it seems to have a good effect in about 80 per cent of all cases. It is not the slightest bit uncomfortable to the patient. If it does not work, then there are other things to be done.

I suspect that all the warts are related. Can you tell me whether that is so? Is the seborrheic wart in the same class as the others?

DR. MCCARTHY Pathologically it is

DR. CHEEVER It seems so clinically. We see the seborrheic type on back and face, the little pedunculated ones on the neck and in the axillae, and little flat abortive ones on the backs of the hands, all on the same patient.

I should like to stress the advantage of treating all the warts on the same individual and on other members of the family at the same time. In one family of eight, all have warts. I can persuade three or four of them to come in within a week or so of each other for treatment, but the rest will not do so. As a result I have seen each member of this family probably four or five times unnecessarily.

In nevus flammeus I did not hear Dr. McCarthy suggest ultraviolet rays, I think they are of some value. I agree with him that carbon-dioxide snow is likely to cause a very unpleasantly mottled scar, and x-ray and radium result, I believe, in one almost as bad.

The so-called strawberry mark should usually be treated less cruelly than is usually done. One doctor has said that radium is the best treatment but that it should be aimed at the wall and not at the skin, because such lesions almost always disappear spontaneously. During the World War I examined the skins of from 75,000 to 100,000 recruits. I did not see one strawberry mark among them, yet in any of our children's hospital outpatient departments we see a number of these marks indicative that most of them disappear spontaneously. Outside of this, I certainly agree with Dr. McCarthy.

I want to emphasize his statement that one should understand the pathology of these lesions before tampering with them, not necessarily the pathology of the identical lesion concerned, but certainly the pathology of that particular type of lesion.

THE CHAIRMAN It is now necessary to appoint a committee to nominate officers for next year. It is customary for the chair to name this committee, and I nominate Dr. Franklin P. Lowry and Dr. Herman A. Osgood.

Three years ago Dr. William Bierman came to us and gave us the result of his research work. He now has two more years of splendid work to his credit. He will talk to us on 'The Treatment of Gonorrhea in Women by Means of Systemic and Additional Pelvic Heating.'

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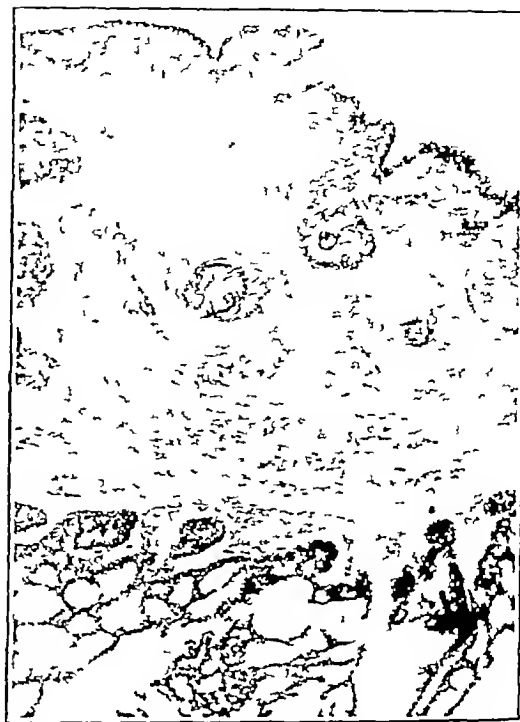


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amount of current energy flowing along each cable. If we find that there is an undue amount of current flowing to one thigh, for example, we increase the resistance in that portion of the circuit, so that the current energy going to the other thigh becomes equalized. After about three hours the thigh cuffs are shifted to the calves.

The vaginal electrode which we use is patterned after plaster casts which we have made of numerous adult vaginas. The metal electrodes which have been made from these plaster casts come in four sizes, varying from 7 to 11 cm in length. The metallic mass of the electrodes and the handles connected to them are channeled so as to permit the insertion of a thermometer.

The thermometer serves as our guide in determining the quantity of diathermy current which is to be applied. It is specially constructed so that, through prisms on either side, its mercury column is readily visible for a distance of several feet. This makes it possible to read the thermometer through the window of the cabinet. The markings on the thermometer are widely separated, with gradations indicating 0.2°F . That amount of diathermy current is permitted to flow which will heat the tissues to a temperature which, transmitted through the metal of the electrode to the thermometer, registers between 109 and 110°F (42.8 and 43.5°C).

The pelvic temperature is held elevated at this higher level while the systemic temperature is maintained at about 106°F (41.2°C). The determination of systemic temperature is made by means of thermometers inserted into the mouth and the axilla. Before starting pelvic heating we determine the relation between the temperatures in the mouth, axilla and rectum. This helps to indicate the systemic temperature as judged by the elevation in the rectum. When the rectal temperature is no longer available as a guide, owing to the distortion produced by the pelvic heating, the mouth temperature is used and is generally considered to be about 0.7°F below the rectal temperature.

The systemic temperature elevation is maintained for about twelve hours. During this time the patient receives fluids, either plain cold water or cold 0.6 per cent saline solution, in quantities as large as she desires. To minimize her discomfort she is given sedation, usually $1/200$ gr of hyoscine hydrobromide in combination with $1/6$ gr of morphine sulfate. If necessary, small doses of morphine are repeated.

In addition to observations of temperature, the general condition of the patient is noted continuously, as determined by the color of the face, rate and character of the pulse, and so forth. Close and continuous watchfulness is essential in order to avoid untoward effects.

The purpose of the higher temperatures in the pelvis is to achieve the quicker lethal influence on the gonococcus. At 106.7°F (41.5°C) Carpenter and his co-workers have shown that the various strains of the gonococcus will resist heating for periods varying from six to thirty hours. At 109.3°F (42.8°C) the killing time is cut to about one half. We recognize that in addition to the direct thermal injury there are immune factors which serve to produce the death of the diplococcus within its human host. It is our experience that this treatment may be applied at any stage of gonococcal infection. However, we prefer not to administer the treatment in the period two days prior to, during and two days after menstruation. If pregnancy be present, there exists the possibility of doing damage to the fetus because of the high pelvic temperature.

We have had the opportunity of treating 125 women by means of this technic. In all these the diagnosis was confirmed by the direct observations of the organism in the cervical or urethral secretion or in both. One hundred and seventeen of these (93 per cent) were freed of gonococci. In our first series, consisting of 67 women who received from five to six hours of general hyperpyrexia, during three and a half to four hours of which additional pelvic heating was administered, 62 were rendered gonococcus-free in an average of 2.3 treatments per patient. In our second series of 58 women who received twelve hours of hyperpyrexia, including from six to eight hours of additional pelvic heating, in 55 the gonococcus disappeared after an average of 1.4 treatments per patient.

The determination of the necessity for re-treatment is based upon the finding of the organisms in cervical or urethral discharges on the day following the treatment. If the stained smears are negative, further examinations are continued at daily intervals for several days. The necessity for re-treatment depends on thermal resistance of the organism responsible for the infection and upon the immunity of the patient.

Within a few days following adequate treatment, there is a subsidence or disappearance of the vaginal discharge. The cervical secretion becomes mucoid and clear, microscopically containing only scattered leukocytes instead of the pus clumps previously found. The urethral smear contains only scattered leukocytes in addition to many epithelial cells and Döderlein bacilli. In a few cases, superficial mucosal burns have caused a prolongation of the discharge, with the healing of the mucosal area within two or three weeks, the discharge disappears. In a few other cases, trichomonas vaginitis has caused a continuation of the discharge fol-

THE TREATMENT OF GONORRHEA IN WOMEN BY MEANS OF SYSTEMIC AND ADDITIONAL PELVIC HEATING

WILLIAM BIERMAN, M.D.,* AND EDWARD A. HOROWITZ, M.D.†

NEW YORK CITY

THE object of the technic which we employ to treat gonorrhea in women is the destruction of the gonococcus within its human host by thermal means. That this can be accomplished at temperatures which the human organism can withstand is amply proved by *in vitro* experiments, as well as by the clinical experience of other workers and of ourselves. Our technic differs from that described by others in that we apply higher temperatures (108 to 110°F, or 42.3 to 43.5° C) to the female pelvis while the systemic temperature is simultaneously held at a lower level (at about 106°F, or 41.2°C). This permits more effective heating in the region where the organism exists—when its ravages are localized to the organs within the pelvis.

To produce this systemic and differentially increased pelvic heating, we first elevate the temperature of the entire body. For this we have employed the short-wave currents alone, a horizontal photothermal cabinet placed over the patient as she lies in bed, and the hot-water bath. At present we use a combination of photothermal and short-wave heating.

Our cabinet contains twelve 60-watt carbon filament lamps arranged so that two, four or twelve may be switched on or off at one time. By means of overhead pulleys and a counterbalancing weight this cabinet is easily lowered or raised over the patient, as she lies on a mattress placed on a wooden table. The entire body except the head is covered by the cabinet.

The patient—who has been previously examined so as to determine that she is not suffering from any disease (aside from her infection) which would contraindicate the treatment—has been given an enema and a light breakfast by way of preparation. Her feet have been wrapped in cotton and her legs encased in cotton leggings to prevent the possibility of a burn. Except for these leggings and a bed sheet placed over her, the patient lies nude within the cabinet.

To speed the elevation of systemic temperature, the conversive heating energy of the short-wave current is utilized. Two condenser pads 30 by 40

cm each are placed under the table so that one lies parallel to the region of the upper back and the other parallel to the area of the mid-thighs. These pads are connected to a short-wave machine of the type usually employed for routine treatment purposes, which produces a current of 50,000 megacycles (6-meter wave length).

Within about two hours the systemic temperature becomes elevated to approximately 106°F (41.2°C). The auxiliary energy of the short-wave current is then dispensed with and the apparatus for additional pelvic heating is applied. If the patient has shown evidence of acute peritoneal inflammation, as indicated by the presence of fever, lower abdominal pain and tenderness, the application of local pelvic heating is deferred for three or four hours.

We have found that the most effective method of applying local heating is by means of diathermy. Short-wave energy administered by metal vaginal electrodes can be used for this purpose. Our first experience in the simultaneous systemic and higher pelvic heating was gained by the use of these currents.¹ However, it is our impression that it is possible to localize the heating effect produced by diathermy more accurately than we can by means of short-wave currents. With the latter the heating process must continue for a period of from six to eight hours, and when this has been done, we have observed occasional overheating of the structures on the inner sides of the thighs. To avoid such local overheating with its painful sequelae, we apply the dispersive diathermy electrodes as follows. A metal belt about 8 cm in width and made of flexible lead-tin composition metal (such as is ordinarily employed for the administration of diathermy treatments) is placed around the waist. Two similar metal cuffs are placed around each thigh. These three electrodes are connected to one terminal of a diathermy machine. The other terminal is connected directly to the vaginal electrode. To arrange for still further dispersion of the current we take a large metal electrode about 25 by 30 cm in size and place it on the back of the patient, so that it makes definite contact with the posterior portion of the metal belt placed around the waist. In the circuit of each of the electric cables going to the three dispersive electrodes we have a milliamperemeter and a variable resistance. The purpose of this arrangement is to indicate the

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†Adjunct gynecologist, Beth Israel Hospital.

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In addition to observations of temperature, the general condition of the patient is noted continuously, as determined by the color of the face, rate and character of the pulse, and so forth. Close and continuous watchfulness is essential in order to avoid untoward effects.

The purpose of the higher temperatures in the pelvis is to achieve the quicker lethal influence on the gonococcus. At 106.7°F (41.5°C) Carpenter and his co-workers have shown that the various strains of the gonococcus will resist heating for periods varying from six to thirty hours. At 109.3°F (42.8°C) the killing time is cut to about one half. We recognize that in addition to the direct thermal injury there are immune factors which serve to produce the death of the diplococcus within its human host. It is our experience that this treatment may be applied at any stage of gonococcal infection. However, we prefer not to administer the treatment in the period two days prior to, during and two days after menstruation. If pregnancy be present, there exists the possibility of doing damage to the fetus because of the high pelvic temperature.

We have had the opportunity of treating 125 women by means of this technic. In all these the diagnosis was confirmed by the direct observations of the organism in the cervical or urethral secretion or in both. One hundred and seventeen of these (93 per cent) were freed of gonococci. In our first series, consisting of 67 women who received from five to six hours of general hyperpyrexia, during three and a half to four hours of which additional pelvic heating was administered, 62 were rendered gonococcus-free in an average of 2.3 treatments per patient. In our second series of 58 women who received twelve hours of hyperpyrexia, including from six to eight hours of additional pelvic heating, in 55 the gonococcus disappeared after an average of 1.4 treatments per patient.

The determination of the necessity for re-treatment is based upon the finding of the organisms in cervical or urethral discharges on the day following the treatment. If the stained smears are negative, further examinations are continued at daily intervals for several days. The necessity for re-treatment depends on thermal resistance of the organism responsible for the infection and upon the immunity of the patient.

Within a few days following adequate treatment, there is a subsidence or disappearance of the vaginal discharge. The cervical secretion becomes mucoid and clear, microscopically containing only scattered leukocytes instead of the pus clumps previously found. The urethral smear contains only scattered leukocytes in addition to many epithelial cells and Döderlein bacilli. In a few cases, superficial mucosal burns have caused a prolongation of the discharge, with the healing of the mucosal area within two or three weeks, the discharge disappears. In a few other cases, trichomonas vaginitis has caused a continuation of the discharge fol-

lowing the disappearance of gonococci. This discharge ceases with the application of measures directed against the vaginitis.

About one third of the cases were complicated by salpingitis. In the acute or subacute salpingitis cases, pain usually disappears after the first treatment. We have observed that treatments may be instituted at any stage of gonococcal infection, even in the presence of acute salpingitis, associated with fever and pelvic peritonitis. Tubo-ovarian inflammatory masses, including those which are probably suppurative and associated with a rapid sedimentation time, respond satisfactorily to this type of treatment. There is first a diminution or disappearance of pain, and a return of the temperature to normal the day following the treatment. The temperature remains normal. Rapid sedimentation rates become slower.

Pelvic examination within a few days after treatment usually reveals a marked lessening of pelvic tenderness, but little change in the size of the adnexal masses. From seven to ten days after treatment there is usually an increased mobility of the uterus and some shrinkage of the inflammatory masses. After about two weeks following the treatment, the adnexal masses become much smaller.

The first menstrual period following treatment sometimes comes on before the expected time, and may be more profuse and of longer duration than usual. We have never observed a cessation of menstruation or the occurrence of menopause symptoms after treatment. A number of patients with chronic salpingitis associated with painful or prolonged menstruation noticed that menstruation became more normal and less painful following treatment.

Pregnancies and normal delivery have occurred in a number of patients whom we have previously treated for gonorrhea by this technic. In a number of patients with acute salpingitis at the time of treatment, insufflation by the Rubin method has subsequently demonstrated normal tubal patency.

The follow-up on most of these cases has been sufficiently prolonged (in some cases extending for a period of five years) to assure us that the disappearance of the gonococci has been permanent. We have relied upon frequently repeated smears,

especially those taken directly after the cessation of menstrual flow. In addition, in many cases we have made cultures. The danger of a woman's becoming reinfected by resumption of relations with the sex partner who originally infected her or with some other infected individual is always to be reckoned with. In 4 cases, after intervals of many months, during which repeated examinations failed to reveal the presence of abnormal discharge or of gonococci, a purulent discharge containing the organisms was again found. In each of these cases there was a definite history of new exposure to an infected partner.

SUMMARY

We have described the technic for the simultaneous production of systemic with still higher pelvic heating. Temperatures of 106°F (41.2°C) are achieved systemically, and of 109 to 110°F (42.8 to 43.5°C) within the region of the pelvis. This combined heating is maintained for a period of from six to eight hours. The interval of systemically elevated temperature is continued for a total of about twelve hours.

With this technic, as utilized in our last series of 58 cases, an average of but 14 treatments was found necessary to achieve the eradication of the gonococcus from its human host. With the disappearance of the organisms, associated symptoms disappear. Pelvic masses gradually subside. In our total series of 125 cases permanent disappearance of the organism was achieved in 117, or 93 per cent.

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THE CHAIRMAN: Will the nominating committee please report?

DR. FRANKLIN P. LOWRY: The committee nominates Dr. Frank E. Wheatley, of Boston, as chairman, and Dr. Herman A. Osgood, of Boston, as secretary.

Dr. Wheatley and Dr. Osgood were declared elected.

THE CHAIRMAN: I declare the meeting adjourned.

TRAUMATIC INJURY OF THE CONDYLOID PROCESS OF THE MANDIBLE

KURT H. THOMAS, D.M.D.*

BOSTON

TRAUMATIC injury of the condyloid process is not easily diagnosed and is often difficult to treat. It may occur in conjunction with a more obvious fracture of the body of the mandible, when it is frequently overlooked. Fortunately, fractures of the condyle often heal without special attention, particularly when prompt treatment by means of intermaxillary ligation and fixation of the jaw is given. There are exceptions, however. Untreated fractures complicated by dislocation may have permanent limitation of motion, and resultant discomfort during mastication. In edentulous jaws considerable shortening of the ramus and asymmetry of the face due to overriding of the fragments is liable to occur if correctly constructed splints are not used. In compound injury with fracture of the articular fossa, or in the presence of infection, ankylosis may result.

Traumatic injury to the condyloid process may be classified as follows:

- I Subluxation (unilateral or bilateral)
- II Dislocation without fracture (unilateral or bilateral)
 - a Forward.
 - b Backward.
 - c Upward.
- III Collum fracture (unilateral or bilateral)
 - 1 Overriding of fragments.
 - 2 Displacement of condyloid process.
 - a Forward.
 - b Medial.
 - c Lateral.
 - 3 Dislocation of the condyloid process
 - a Medial.
 - b Lateral.
- IV Traumatic ankylosis (unilateral or bilateral)

SUBLUXATION

Subluxation is often the result of minor trauma such as occurs when difficult tooth extractions are attempted, with application of undue force by means of forceps or elevators instead of the resection of a sufficient amount of alveolar bone to facilitate the operation. Careless use of the mouth gag during general anesthesia is another cause producing rupture of the joint ligaments or injury to the meniscus.

The patient complains of weakness of the joint felt when yawning or when undergoing prolonged operations in the dental chair. In some cases the condyle catches every time the jaw is opened wide, receding with a jumping motion. This is fre-

quently due to the rupture of the attachment of the external pterygoid muscle to the meniscus, which causes the latter to remain in place during the forward movement of the mandible instead of being pulled forward. The condyle therefore slides off its anterior margin, producing a sound when it strikes the articular eminence, this sound often becomes extremely annoying to the patient, as it occurs principally while eating and is audible to others. Subluxation may be unilateral but is generally bilateral.

The motion of the jaw should be limited by a dental appliance, or motion should be entirely prevented by means of intermaxillary ligation, so as to allow the ligaments to regain normalcy. This may require from three to six weeks. Intermaxillary fixation is to be preferred to the use of a four-tail bandage—first because it is invisible, and secondly because the patient is unable to remove it. Liquid diet should be prescribed.

DISLOCATION WITHOUT FRACTURE

The mandibular joint possesses motion not possible in any other joint, therefore trauma will not always markedly increase its limitations, and dislocation may occur frequently without the joint capsule's being ruptured and without the condyle's piercing it. Dislocation is frequently associated with fracture at the neck of the condyle or the ramus, and indeed many dislocations can occur only in conjunction with fracture. These will be discussed later. Dislocation of the mandible without fracture occurs bilaterally more often than unilaterally.

Forward dislocation. Though comparatively rare, this type of dislocation is more frequent than others. It occurs occasionally in newborn infants during delivery, especially in head presentations, but is seen more often in adults. It may be caused by a blow on the chin when the mouth is open, by opening the jaws too far when yawning or by the injudicious use of a gag under general anesthesia. When dislocated the condyle rests anterior to the articular eminence, where it is locked by tension of the temporal internal pterygoid and masseter muscles. The stylomandibular ligament, which is relaxed in ordinary forward motion, also becomes taut. The jaw remains in this position, as the combined effort of the muscles can no longer pull the head of the condyle back.

In acute forward dislocation the jaw is locked in

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a position that causes a so-called open bite. The chin is moved forward and down. Eating and talking is difficult, and there may be salivation and dribbling. In chronic dislocation the jaw slips back into its normal position more easily because the capsular and sphenostylomaxillary ligaments have been stretched. The patient, however, is well aware of the condition and fearful of repeated experiences, which are brought about from the slightest cause because of weakness in the articular attachments. Yawning or opening the mouth wide as during dental operations may bring on dislocation.

The symptoms, together with the prominence of the condyles, which can be easily palpated when the jaw is dislocated, aid in diagnosis. The latter may be verified by means of x-ray examination (Fig 1).

In acute dislocation, reduction by means of any force that makes the muscles and ligaments yield is inadvisable. It would cause further injury of the tissues, analogous to that which is often the cause of chronic dislocation. Instead, careful manipulation should be resorted to, reversing the process of dislocation. This is accomplished by opening the jaw wide, depressing the chin, and forcing the lower end of the ramus upward and backward. The head is thus made to glide over the eminence and back into the articular fossa; the jaws can then be closed. The use of general anesthesia facilitates the operation through relaxation of the muscles.

In order to prevent recurrence in acute dislocation, the motion of the mandible should be limited for a few weeks by applying bands to the teeth, to which are attached intermaxillary elastics or a silk cord to limit the opening to 1 cm.

In chronic dislocation the prognosis is rather poor. If not of too long standing, rest as described for subluxation may be of help. When dislocation occurs frequently and is accompanied by complete locking, permanent appliances as described for the acute type may be constructed.

Case 1 The patient, a 42-year-old female, complained of protrusion of the jaw. The earlier history was irrelevant. The present complaint had started six weeks previously, when she had had her remaining upper and lower teeth extracted. The mandible protruded and could not be moved as before. There had been no accidents or injury.

Clinical examination revealed prominent condyles on both sides of the face. The motion of the jaw was limited. Roentgen examination of the mandibular joint showed the condyle anterior to the eminentia articularis on both sides. The diagnosis was forward dislocation of the mandible (Fig 1).

Under ether anesthesia the condyles were manipulated to take their place in the mandibular fossae, when the true relation of the mandible to the maxilla was taken by plac-

ing wax plates previously prepared by the patient's dentist in the mouth and forcing the jaws into place. A temporary splint was improvised and held in place by a Barton bandage. Later the permanent splint constructed from the wax models was inserted and the jaw was held in



Figure 1 *Case 1* Forward dislocation of the mandible. The condyle is locked anteriorly to the articular eminence. A = fossa articularis B = position of condyle (C), anterior to articular eminence.

place by a four tail bandage for 6 weeks. The result was satisfactory, and the patient had upper and lower dentures made and could wear them without trouble.

Backward dislocation A blow directed backward against the chin may cause detachment at the posterior margin and forward displacement of the meniscus. The head of the condyle moves backward and upward, coming in contact with the glenoid fossa. This type of dislocation is fortunately of rare occurrence. I have seen it in the case of an automobile accident, the blow striking the chin without causing fracture of the body of the mandible. Hemorrhage which accumulates in the posterior part of the joint prevents the disk from returning to its normal position. In more serious trauma the bone may be crushed into the auditory canal, this may terminate in ankylosis (see below).

Such patients have the third molars in distal occlusion with open incisal bite (Fig 2). Motion of the jaw is interrupted when opening on account of interference from the displaced meniscus. In the case of fracture of the tympanic plate, bleeding from the ear is generally noticed and examination of the auditory canal may show obstruction.

Under ether anesthesia, with muscles well relaxed, the mandible is manipulated. Force is applied that tends to draw the condyle out of the articular fossa, this in turn may allow the meniscus to slide back into place. In order to keep the condyle out of the joint fossa until the tissue has recovered, the occlusal surface of the teeth should be raised in the upper jaw by inserting a rubber-plate

wedge made to fit over the posterior teeth. The jaw should not be immobilized, however, as motion is desirable to prevent fibrous ankylosis.

Case 2 The patient, a 30-year-old male, complained of inability to eat because he could not get his teeth to occlude, except the molars, and was unable to open his jaws wide on account of interference. He said that the surgeon who had treated him had asserted that under ether his jaw could be closed normally. The earlier history was irrelevant. The illness started after an automobile accident, when the maxilla was fractured on the right side, the fracture included the malar bone. The patient had since received treatment, and although the fracture had healed, his symptoms had not improved.

The clinical examination showed that the fractured part of the upper jaw had united too far lingually so that the teeth could not occlude normally. Furthermore, the in-

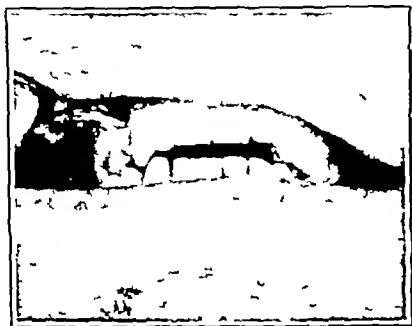


Figure 2. *Case 2 Backward dislocation. The condyle being pushed back and up against the glenoid fossa causes an open bite.*

cisors and premolars could not be brought into contact, as the last molar teeth on both sides came together and prevented closing of the bite. As this condition was the same on the left, where no fracture had occurred, it could not be attributed to the above mentioned malunion. Sometimes the patient could open his jaw wide, but at other times something interfered and he could open it but little. X-ray examination was advised, and a provisional diagnosis of backward dislocation of the mandible with displacement of the interarticular cartilage was made.

The x-ray report was essentially negative. There was no evidence of fracture or malunioned fracture in the region of the ramus or at the neck of the condyle.

With avertin and nitrous-oxide-oxygen anesthesia osteotomy was performed on the right maxilla, and a previously constructed splint was applied so as to assure healing in a normal position. The defective occlusion of the mandible was not improved thereby. The anesthesia was supplemented with ether to get complete muscular relaxation so that the jaw could be manipulated. It was found that by forcing down the ramus the mandible could be occluded normally. After a few attempts the jaw remained in normal position when closed, presumably because the meniscus had moved back into its normal place. Intermaxillary ligation was then used, by wiring the teeth to the splint in the upper jaw it was hoped that the incisors could not be forced back into the opened position.

A Barton bandage was applied to prevent pulling down of the side where the maxilla was fractured. After 5 weeks the wires were removed when it was found that the patient had no difficulty in closing his teeth normally and that the opening motion was no longer interfered with.

Upward dislocation This is extremely rare and may occur in conjunction with backward dislocation, or as a more serious condition when the condyle is forced through the glenoid fossa into the middle cerebral fossa. This is liable to happen where there are no posterior teeth to take up the force when a blow is directed to the anterior part of the mandible.

Reduction under general anesthesia should be followed by the application of a denture splint replacing the missing back teeth, the bite being opened at the same time. External drainage may be indicated. The splint should immobilize the jaw for four or five weeks. If ankylosis results, exercises with the purpose of forcefully opening the jaws are indicated. In extreme cases arthroplasty must finally be resorted to.

COLLUM FRACTURE OF CONDYLOID PROCESS

This is a common fracture, and probably occurs more frequently than statistics indicate, for in multiple fracture it is often overlooked. It is generally found at the lower part of the neck of the condyle (Fig 3), it frequently involves part of the ramus, extending in an oblique direction downward to the posterior border of the bone (Fig 4).

The fracture is caused by a blow on the chin, and is usually bilateral. It is often associated with fracture in the region of the symphysis. Unilateral fracture of the condyle may be associated with fracture of the mandible on the other side in the premolar or molar region. It may occur, however, as a single fracture when the blow is directed to the side of the face, for instance, in the region of the middle of the ramus. I have seen bilateral fractures caused by the following accidents: a girl of nine falling from a bicycle and striking her chin on the sidewalk, a rider falling when taking a hurdle, a flier landing his airplane, an amateur tree-chopper getting hit on the chin by the falling trunk, and several patients injured in automobile accidents. I have seen unilateral fractures in a boy who fell while roller skating, in a patient who received a lateral blow to the angle of the jaw, and in victims of automobile accidents. In one patient the collum fracture from a lateral blow was associated with fracture of the maxilla.

Collum Fracture with Overriding of Fragments

The overriding of the fragments is caused by muscular contraction. This is due to trismus resulting from collateral edema associated with the trauma. If most of the posterior teeth are present the condition is recognized by open bite in the incisor region. In jaws edentulous in the posterior part, it may be overlooked until after the swelling of the face has subsided, when we discover facial asymmetry, the angle of the jaw being higher and

the chin being moved toward the affected side. In cases where the jaw has united in such a position the patient complains of painful sensation in the joint and ear. This is due to pressure or friction caused by the condyle when moved in its abnormal relation.

Diagnosis is made by means of x-ray examinations of the joint from a lateral point of view and from an anteroposterior aspect. One or the other, or both, will show the deformity.

Treatment should be instituted as soon as possible after the accident. The fracture is reduced by means of manipulation under ether, followed by intermaxillary ligation if a full complement of teeth is present. In case of partially edentulous jaws a denture splint must be constructed before the reduction is attempted. This is inserted after satisfactory results have been obtained by manipulation, for the purpose of holding the jaws in proper relation while healing is taking place.

In malunion of long standing, discomfort in the joint may subside in time. If dentures are worn, these may have to be adjusted to the new maxillary relations, and this may also help to improve the condition. If pains are persistent, however, and radical surgical treatment is necessary, an osteotomy at the neck of the condyle may have to be performed, which when followed by fixation of the jaw in normal position will bring back normal relations. In complicated cases, osteoarthrotomy or arthroplasty may have to be resorted to.

Case 3 The patient, a 28 year-old female, complained of pain when moving the jaw, with pain in the ear and swelling of the face. The earlier history was irrelevant.



Figure 3 *Case 3* Collum fracture with overriding of fragment and shortening of the ramus due to muscular trismus. C = condyle F = fracture line

The condition was caused by an automobile accident 2 days before.

On clinical examination the posterior maxillary teeth on the left side were freely movable with a large section of the alveolar bone. There was crepitus on the left side when the jaw was opened, and pain upon pressure applied in front of the tragus of the ear. Provisional diagnoses

of fracture of the alveolar process of the maxilla and collum fracture of the left mandible were made. Roentgen examination was advised.

Intraoral films showed a fracture of the maxilla involving a fragment containing premolar and molar teeth. The mandible showed horizontal fracture through the neck of the condyle, with overriding of fragments and shortening of the ramus (Fig 3).

Under ether anesthesia a splint was placed in the upper jaw to hold the fractured parts in position. The ether anesthesia deepened and when the muscles of the jaw became relaxed the fracture of the condyle could be reduced by manipulation. Fixation was secured by intermaxillary ligation. Recovery was uneventful, and the splints and wires were removed after 6 weeks. Normal moulty was obtained after 10 days, during which the patient was advised to exercise the jaw systematically.

Case 4 This patient, a 24 year-old female, complained of a pain in the right mandibular joint and a crackling noise in the left one. She was unable to wear her dentures. She had been in an automobile accident 6 weeks previously, hitting the dashboard with the right side of the face (ramus). She had seen her family physician, who applied adhesive tape. Her teeth had all been extracted 7 months before, and she had had full dentures made 5 months before. These she had worn with comfort until the accident.

Clinical examination showed asymmetry of the face, the chin being drawn to the right, the median line of the lower denture was transposed about 1 cm to the right, and the teeth therefore did not occlude. Movement of the jaw was not interfered with, but a noise could be heard when the jaw was opened. There was no crepitus or other indication of ununited fracture.

The roentgen examination consisted of lateral and vertical exposures. The latter revealed a malunited fracture at the neck of the condyle of the mandible on the right. There was a slight outward displacement of the condyle, and because of overriding the ramus was shortened. The outline of the mandible and its location were asymmetrical.

The patient was advised to have a new set of dentures constructed by her dentist. These proved successful. The pain in the joint was relieved, but the facial appearance was not greatly improved.

Collum Fracture with Displacement of Condylar Process

Forward displacement This is the commonest type of displacement, since the external pterygoid muscle is attached to the neck of the condyle at the pterygoid pit and in case of fracture draws the neck of the condyle forward. The condition is recognized in a lateral x-ray of the mandibular joint (Fig 4).

Medial and lateral displacements Lateral displacement is more common. It is caused when the ramus is pressed upward on the inside of the condylar fragment, locking it into position by contraction of the masseter and internal pterygoid muscles. Lateral x-rays show the overriding, the anteroposterior view, on the other hand, shows the medial or lateral displacement of the condyle.

Reduction is accomplished by manipulation.

under avertin and ether anesthesia. The patient must be prepared for the operation so as to avoid postoperative vomiting. The jaws are immobilized for from five to six weeks by intermaxillary ligation or the use of splints. In cases of marked forward displacement, open reduction may be indicated. When the head of the condyle is moved into place it can generally be fixed by wiring the teeth, which is done by an assistant, the wound being protected by a piece of wet gauze. If this is not successful a galvanized nail may be placed anterior to the condylar fragment to hold the latter in place. It is allowed to project through the wound and is removed after a week or ten days.

Case 5 The patient, a 24-year-old male, complained of a fracture of the mandible, with bleeding from the chin, pain and inability to close the jaw. The previous history

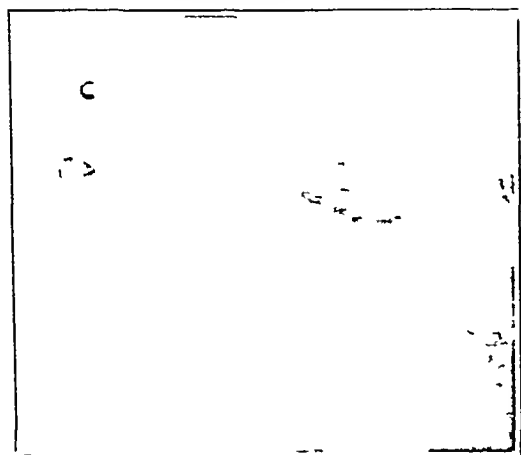


Figure 4 *Case 5* Collum fracture bilateral with fracture at symphysis of mandible the x-ray shows a fracture of the condyle on the left with forward displacement of neck and overriding due to muscular contraction C = condyle F = fracture line

was irrelevant. The present illness started with an accident which occurred while the patient was cutting down a tree, the falling trunk struck him on the chin.

At the clinical examination there was pronounced swelling under the jaw and on the chin where there was a contusion of the skin. There was a slight swelling of both cheeks. The mandible had been displaced and there was crepitus in the anterior part and the region of the joints. The left superior central incisor was loose, as well as the right inferior central.

In the roentgen examination anteroposterior and lateral exposures were made. These showed a vertical fracture in the anterior portion of the lower jaw, close to the median line. Here an unerupted tooth was seen, which lay horizontally. The tooth did not seem fractured but the fracture line extended beyond it. The lateral view showed fractures at the necks of the condyles on the right and left sides. Both condyles appeared to be displaced anteriorly and there was overriding due to muscular contraction (Fig 4). Dental films of the upper teeth showed luxation of the left central incisor.

With premedication pentobarbital sodium (3 gr Nembutal), and gas-ether anesthesia the retained tooth

in the anterior part of the mandible was removed. The upper central tooth was extracted, as well as the lower one, which was found involved in the fracture. The jaw was placed in what appeared to be normal position and fixed with intermaxillary ligation. Roentgen examination after operation showed that manipulation of the fragments had not produced good results at the condyle. The patient was operated on again 2 days later. An external incision was made in front of the ear and extended at right angles along the zygomatic process. The condyles were exposed and forced into normal position. The patient was dismissed 11 days after operation. Healing was uneventful. Fifty-one days after the second operation the patient had normal union and could move his jaw well, occlusion was satisfactory.

Case 6 The patient, a 37-year-old male, complained of pain when moving the jaw and a swelling on the right side of the head. The previous history was irrelevant. The patient had a fall while taking a hurdle on horseback, injuring his left arm and shoulder, right ankle and face.

Clinical examination showed the region of the right condyle of the mandible to be tender on palpation, there

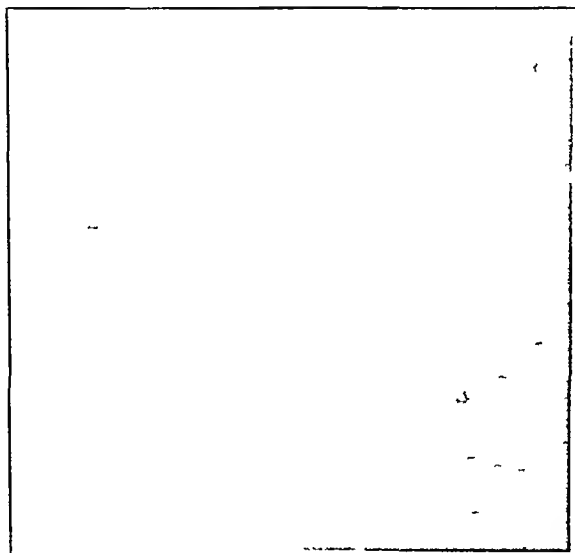


Figure 5 *Case 6* Collum fracture with lateral displacement C = condyle

were pain and crepitus when moving the jaw. A provisional diagnosis of fracture of the ramus was made.

Roentgen examination of the left arm and shoulder, thoracic cage, right leg and foot, and skull showed no evidence of fracture. The anteroposterior view of the head showed a fracture at the neck of the condyle, displaced laterally. There was considerable overriding, due to muscular contraction (Fig 5).

The fracture was reduced with ether anesthesia and the position retained by intermaxillary ligation. After 5 weeks the wires were removed and motion of the jaw was found to be normal except for slight muscular interference, which disappeared in a few days.

Collum Fracture with Dislocation of Condylar Process

Luxation fracture is not very common in the mandible, probably because of the free movement which is allowed the condyle in the joint. It oc-

curs as follows the bone fractures but does not separate, and on account of continuance of the traumatic action the condyle is then pressed out of the capsule either medially or laterally. Compound dislocation is rare.

Medial dislocation This is the common type of dislocation because of the action of the external pterygoid and the anatomic condition of the fossa articularis, which favors a medial dislocation rather than a lateral one. The meniscus generally remains in the fossa, while the condyle pierces the capsule. The cause may be a blow to the angle of the jaw, causing fracture at the neck without displacement, the continued force pressing the medially bent condyle out of the socket.

Case 7 The patient, a 9 year-old boy, had a swelling of the parotid region, and consulted his dentist on account of pain from an injured tooth. The dentist referred the patient for examination. The earlier history was irrele-

place by means of a hook while the ramus was pressed down by an assistant. The condyle could then be seen functioning in the socket as the jaw was moved. The fascia was brought together and held by catgut sutures, and the incision was closed with horsehair sutures. The teeth were fixed in occlusion by intermaxillary ligation. When the wires were removed after 23 days the jaw was stiff, but when the patient was seen 5 days later he had regained normal function.

Lateral dislocation This type is uncommon, as it is prevented by the very strong outer capsular ligament, and the protection afforded by the zygomatic arch. A case has been reported where the ramus fractured at the angle and the condyle was dislocated in a lateral and upward direction. In such cases compound fracture may occur.

The diagnosis is made by means of x ray examination. The anteroposterior view best shows the dislocation (Fig 6). The lateral view generally discloses the fracture line. There may be considerable swelling of the face. In the case reported above, this was mistaken for mumps and the patient received no treatment for two weeks.

Reduction is indicated even in cases of one or two weeks' standing, although the prognosis of an untreated dislocation is not bad, the condyle and ligaments having great power to adjust themselves to a new position, especially in children. If the fracture is incomplete, manipulation under general anesthesia may reduce the dislocation. As a rule, open reduction must be resorted to. The approach is through an incision along the lower border of the zygomatic arch, after which the condyle is located by blunt dissection. In lateral dislocation this presents no special difficulty, in median dislocation the external surface of the ramus should be exposed after detaching part of the masseter muscle. The condyle can then be located, taken hold of by means of an instrument with a half round, pointed hook, and pulled back into position while the ramus is pressed down. The wound is then closed and the jaw fixed by means of intermaxillary ligation or a splint. In spite of fixation, the retention of the meniscus and of the synovial membrane, if intact, prevents ankylosis. In case of destruction of the joint, however, ankylosis may result, especially in children. In such cases an arthroplasty may have to be performed later. When using intermaxillary ligation for retention it is important that the patient have no posterior edentulous condition on the affected side, because undue pressure on the condyle may cause resorptive processes during the period of fixation.

After four weeks the ligatures are removed. Although the result may be good, the patient may not have normal function at once. Exercises must be prescribed to limber up the jaw and to increase motility.



Figure 6 Case 7 Collum fracture with median dislocation C = condyle, F = fracture

vant. Two weeks previously the boy fell on the sidewalk and injured a front tooth. The next day a swelling appeared in front of the ear on the left side, and he was put to bed, as he was thought to have the mumps.

Clinical examination revealed a swelling in the zygomatic region, the patient could open his mouth only part way, and complained of pain when pressure was applied in the region of the condyle.

At roentgen examination the lateral view of the left side of the mandible showed an oblique fracture at the neck of the condyle without displacement. The anteroposterior view showed median dislocation of the head of the condyle (Fig 6).

Avertin anesthesia supplemented by ether was used. An incision was made over the zygomatic arch, and the ramus was exposed. The condyle was located and pulled into

TRAUMATIC ANKYLOSIS

Ankylosis of the jaw may follow traumatic injury, although it is more frequently caused by infectious arthritis, otitis media and osteomyelitis of the ramus. Orlow,¹ who wrote one of the most comprehensive articles on mandibular ankylosis, found trauma as the cause in 28 cases out of 100. In 23 of these cases the trauma was due to accidents such as a fall on the chin, a blow, or a fracture of the body of the jaw or base of the skull. In a few cases there was a compound fracture due to gunshot injury, and in 2 cases forceps delivery was the cause. We therefore find ankylosis resulting from a variety of traumatic injuries, the immediate causes, however, are interarticular hemorrhage, comminution of the joint and secondary infection. A case of fracture of the base of the skull complicated by otitis media and mastoiditis and followed by bony ankylosis and hyperostosis is reported below.

Ankylosis may be due to the formation of fibrous bands which firmly connect the condyle with the articular fossa. This condition frequently follows comminution of the interarticular meniscus or its destruction by secondary infection. It generally allows moderate hinge movement, but no forward and lateral motion. The patient is able to masticate moderately, particularly if he makes an effort to prevent complete ankylosis by means of exercises.

In other types of mandibular ankylosis there is bony union and therefore complete loss of function. This may be the end result of fibrous ankylosis, but may also occur directly, especially in trauma resulting in fracture or comminution of the bony part of the joint in the presence of infection. Extensive hyperostosis may result, with firm attachment to the base of the skull, or with union of the ramus to the zygomatic arch, often including the coronoid process.

The onset of ankylosis is not always promptly recognized because its development is gradual, and is often overshadowed by more noticeable symptoms such as swelling of the face, fractures of the body of the mandible or base of the skull and secondary infection of adjacent parts. Infants may have mandibular ankylosis, which during the period of nursing from the breast or the bottle may be overlooked, often until much later when solid food is ordered.

When ankylosis is complete there is generally little difficulty in establishing a diagnosis, as the patient's chief complaint is a long-standing history of inability to open the mouth. Fracture of the condyle of recent origin, which often prevents free motion, can easily enough be ruled out. Muscular trismus, however, sometimes produces complete locking of the jaw (pseudoankylosis),

and when it becomes chronic, as in cases of actinomycosis and myositis ossificans, may be mistaken for ankylosis vera. The commoner acute type of trismus of the masseter and internal pterygoid muscles is more easily differentiated. It is as a rule of very recent development, and is due to infection, particularly pericoronary infection around a partly erupted third molar. It is attended by pain, swelling at the angle of the jaw, painful deglutition and a rise in temperature. The x-ray easily discloses the condition. For the purpose of differential diagnosis it should also be remembered that the head of the condyle may be the seat of osteoma or chondroma. Such a case has been described by Ivy.²

In fibrous ankylosis the patient generally has slight motion, while in bony ankylosis motion is completely lost. The condition may occur bilaterally, but more frequently only one joint is affected. In cases of long standing the second joint may remain normal and retain its ability to function properly after operation on the affected side. If it is normal, the patient can push down the ramus slightly so as to create a small space between the molars, even if the other side is completely fixed.

In cases of ankylosis acquired very early in life the mandible remains markedly underdeveloped owing to lack of mastication. The chin recedes and the teeth are often crowded, so much so that the first permanent molars have insufficient room in which to erupt. The teeth also become carious and abscesses may form. Some patients are extremely undernourished, although it is remarkable how some of them, especially children, manage to push food into their mouths behind the last molars or through spaces created by the loss of deciduous teeth.

Ear deformities or the entire loss of the external ear are sometimes associated with childbirth trauma. I³ have reported a case of this type elsewhere. When treating such cases it must be remembered that the muscles are either underdeveloped or atrophied if ankylosis occurs late in life. This accounts for the disappointing fact that after an arthroplasty has been performed the patient cannot open his jaw very wide. Daily exercises are indicated in such cases, and often a dilator must be used for a long period of time in order to accomplish the desired result.

Roentgen examination often gives valuable information, although the result may be disappointing on account of anatomic conditions. In cases where hyperostosis is excessive and where ankylosis with the base of the skull or zygoma is involved, good roentgen demonstration of the deformity is especially difficult. It is nearly always necessary to take exposures from various angles, and the anteroposterior as well as lateral positions

are needed. Sometimes stereoscopic pictures are of value.

The treatment of ankylosis is surgical. Severing of the fibrous connections in the joint is seldom successful partly on account of the great depth of the condyle, which makes access difficult, and partly because this severance would hardly give permanent relief. Osteotomy at the neck of the condyle with arthroplasty often prevents reattachment, but only temporarily. The most satisfactory result is gained from osteoarthrotomy.

In performing an osteoarthrotomy a horizontal incision made over the zygomatic process and extended at right angles in front of the ear down to the tragus gives the desired exposure. The condyloid process is sectioned first generally at its attachment to the ramus, at about the height of the mandibular notch. The condyle is then excised. If there is considerable hyperostosis the chisel has to be used to separate the bone from the base of the skull or from the zygomatic arch. If the coronoid process is involved the osteotomy must be performed in the upper part of the ramus, with separation and excision of both the condyloid and coronoid processes.

Case 8 The patient, a 6-year-old boy, was referred for examination because his head had ached several times during the previous week, and because he had had pains in the stomach and vomiting. He was unable to open his jaw and could not eat properly. The previous history

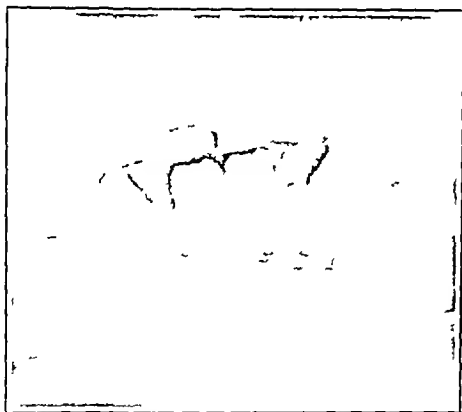


Figure 7 *Case 8* Before operation the patient was not able to open his jaw.

was irrelevant. The boy had never been injured before or had previous trouble with his ears or jaw. The illness started 18 months previously, when he was knocked unconscious by an automobile. He was treated at a hospital for fracture of the left femur, which was somewhat comminuted; the leg was angulated and shortened. Soon after admission the patient developed an acute mastoiditis which was operated on. A definite fracture of the skull not visible in the x-ray picture, was discovered at operation. He was dismissed 2 months after the accident and was followed in the outpatient department, the last visit having been made 10 months previously.

The physical examination showed a thin, poorly developed and poorly nourished child, the skin was pale. He was unable to open his jaw. The right side was absolutely fixed, on the left side the teeth could be opened about 15 mm (Fig 7).

Roentgen examination showed a normal mandibular joint on the left, and bony ankylosis and hyperostosis of the condyle on the right (Fig 8).

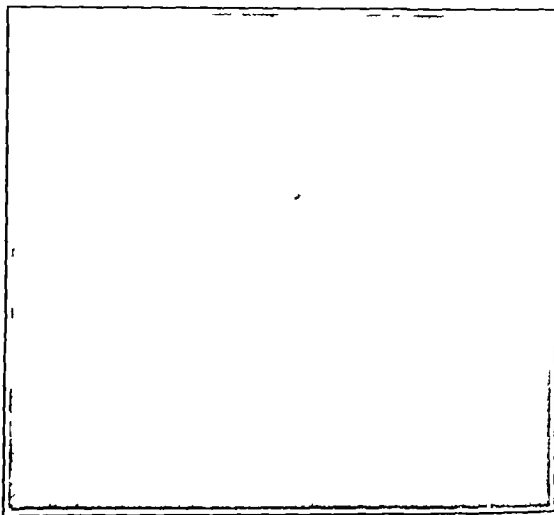


Figure 8 *Case 8* Ankylosis and bony hyperostosis of the mandibular joint. Osteotomy was performed between the white dots and the bony mass was excised. C = enlarged condyle.

The diagnosis was bony ankylosis of the right mandibular joint. Osteoarthrotomy was advised.

With avertin and ether anesthesia an incision about 4 cm long was made along the zygomatic arch, and was extended by vertical incision in front of the tragus. After dissection of the skin flap the fascia was divided and the posterior attachment of the masseter muscle to the

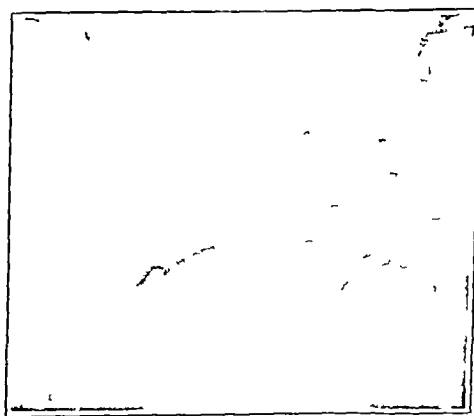


Figure 9 *Case 8* After osteoarthrotomy the patient could open his jaw freely and masticate well.

zygomatic arch was severed. This brought into view the head of the condyle which was found to be greatly enlarged and about the size of a pigeon's egg. When the capsule was opened the articular surface was found solidly ankylosed to the glenoid fossa. The periosteum was

incised and the ramus was bared at the site of the attachment of the bony mass. Here an osteotomy was performed the chisel being forced in an oblique direction from the middle of the mandibular notch down to the posterior border of the ramus (Fig. 8). The jaw could then be forcibly opened to about 2.5 cm between the incisor teeth, after which it was freely movable. Next, the head of the condyle was excised, being separated from the base of the skull with a chisel. Its removal left a large space, which was partly filled with a piece of masseter muscle, turned over the cut-off part of the ramus and sutured to the internal pterygoid. A rubber drain was inserted to prevent hematoma. The fascia was sutured with catgut, and the skin with horsehair sutures.

The immediate postoperative condition was good, and the next day when the patient was examined it was found that he could open the jaw wide and without pain (Fig. 9). There was no facial paralysis. There was considerable local swelling about the wound but no infection. The drain was removed on the 2nd day. On the 4th day the patient developed a temperature of 103.5°F without pain in the jaw or other symptoms, and on the 6th day the temperature was 104.5°F, when a diagnosis of acute tonsillar tonsillitis was made by a consultant. He received treatment and the healing progressed uneventfully from then on. He was given chewing gum to exercise his muscles the 1st day after operation, and when dismissed was much improved physically, owing to the fact that he ate well and could masticate his food. At a re-examination 2 months later, it was reported that he was eating well and without any discomfort. He had very bad teeth because he had not been able to clean them or have them filled while his jaw was ankylosed, and was referred to a dental clinic for treatment.

SUMMARY

Traumatic injury of the condyloid process frequently results from minor trauma, such as occurs from application of undue force when extracting teeth, or from careless use of the mouth gag under general anesthesia. This often causes an injury involving the joint capsule, or the meniscus, or both, and produces a weakness of the joint that may be associated with an audible noise when eating.

More severe injury may produce dislocation of the mandibular joint. Forward, backward and

upward dislocations are distinguished. Diagnosis is made by clinical signs and x-ray examination. In forward dislocations the treatment is reduction, often under general anesthesia, to effect complete relaxation of the muscles, and the application of an appliance to limit motion for a few weeks. In case of backward and upward dislocations a rubber plate inserted over the teeth may be used to keep the condyle out of the joint fossa until the tissues have been restored to normal.

Fractures of the condyle occur more frequently than statistics indicate. In case of multiple fractures a collum fracture of the mandible may be easily overlooked. Careful x-ray examination from various positions is necessary for a complete diagnosis, as this fracture often is associated with forward, medial or lateral displacement of the neck of the condyle, or with medial or lateral dislocation of the head of the condyle.

The fracture can generally be reduced by manipulation under ether, after which intermaxillary ligation or the use of a splint is employed to immobilize the jaw. If there is marked displacement of the neck, or in cases of dislocation of the head of the condyle, open reduction may have to be resorted to in order to avoid malocclusion and associated masticatory difficulties. This is effected through an incision along the lower border of the zygomatic arch. The condyle can be pulled into position with a hook while the ramus is pressed down by an assistant.

In cases of traumatic destruction of the joint, or in untreated cases which have become ankylosed, osteoarthrotomy may be indicated.

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IMMEDIATE SURGERY IN ACUTE CHOLECYSTITIS

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IT IS apparent that surgical opinion regarding the delayed versus the immediate treatment of acute cholecystitis is gradually shifting toward the latter. The discussion has been revived from time to time by surgeons who disagree with the teachings of a previous generation that delayed operation is the treatment of choice, and who favor immediate surgery. Notable in this group are Miller,¹⁸ Graham,⁹ Eliason and McLaughlin,⁷ Zininger,²⁵ Stone and Owings,²¹ Mentzer,^{10, 17} Andrews³ and Heuer.¹¹ We agree that immediate operation is the ideal procedure, not only because our clinical experience with it has been highly satisfactory, but also and more especially because we believe that the underlying diseased process demands immediate attention.

The term "acute cholecystitis" implies an infectious process in the gall bladder, and is therefore misleading. Most students of the pathology of this disease now agree that obstruction of the cystic duct is the primary factor and that infection—when present—is almost always a secondary phenomenon depending on obstruction for its development. Usually the obstruction is caused by a stone (Baumgartner,⁴ Andrews,³ Judd,¹³ Hayes,¹⁰ Zininger,²⁵ Wilkie,²³ Lobingier¹⁵). In our experience a stone was impacted in the cystic duct in 28 of 29 cases. It is recognized, however, that obstruction may also occur as the result of edema arising from chemical irritation, for example, the regurgitation of pancreatic juice, or from edema caused by the lymphatics about the cystic duct, this lymphatic involvement being secondary to infection arising in the liver, the blood or the bowel. Allergy has recently been added by Alvarez¹ to the possible causes of edema in the region of the cystic duct. In general, however, it is true that in nearly all cases of acute cholecystitis the cystic duct is obstructed by a stone.

The anatomic relations of the cystic duct and the cystic artery, veins and lymphatics are such that obstruction to the duct inevitably involves to some degree the other structures at the root of the gall bladder. The cystic duct is naturally tortuous, and has numerous valves and papillary infoldings of mucous membrane in its lumen. We have repeatedly noticed that the artery leading to the gall bladder tends to take a short, straight course across the cystic duct to the gall bladder wall. During cholecystectomy, division of the cystic artery per-

mits the tortuous folds of the cystic duct to be elongated, and to be elevated from 0.5 to 1 cm. The veins and lymphatics leaving the gall bladder are extremely numerous, and are much more closely associated with the cystic duct than is the artery.

Impaction of a stone in the cystic duct produces swelling about the stone, which in turn affects the lymphatics, the veins and the artery leading to the gall bladder. The pressure on these structures will vary in degree according to the anatomic structure in the given case. Edema arising from pressure on the lymphatics and veins is probably the earliest result of an obstruction in the cystic duct. As this edema persists and increases, further interference with the blood supply occurs, so that in some cases branches of the cystic artery are shut off. Complete occlusion of the cystic artery rarely occurs (Lobingier¹⁵), but if it does, complete gangrene of the gall bladder results.

The development of edema, necrosis, gangrene or perforation in the wall of the gall bladder is therefore immediately dependent upon the extent to which the blood supply of the gall bladder is involved by the swelling around the cystic duct. Denton⁶ likened acute cholecystitis to a hemorrhagic infarct. The extent of the involvement of the gall-bladder wall varies according to whether large or small branches of the cystic artery are obstructed. Venous thrombosis is rare (Andrews³), the veins are usually dilated because of obstruction in the large venous plexus surrounding the juncture of the cystic and common ducts. Patches of gangrene and even perforation will occur as the edema, infarction and necrosis advance. Variations in the speed with which these changes occur after obstruction of the cystic duct appear will be pronounced, since the anatomic relations between the cystic duct, the artery and the veins are by no means constant.

There have been many studies of the bacteriology of acute cholecystitis, the outstanding ones in recent years being those made by Wilkie,²³ Denton,⁶ Feinblatt,⁵ Nickel and Judd,¹⁰ Branch,³ and most recently Andrews.² On one point all these investigators are in agreement, namely, that infection of the gall bladder is probably not the primary etiologic factor. Thus, Wilkie²³ showed that acute empyema followed intravenous injections of streptococci into animals when the cystic duct was obstructed, but failed to do so when it was patent. Nickel and Judd¹⁰ found pathogenic bacteria (streptococci) in the majority of cases of acute

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and subacute cholecystitis, while in the chronic cases, cultures taken from the gall-bladder contents were often sterile. Denton⁹ has failed to demonstrate lesions primarily of a bacterial nature in acute cholecystitis, and concludes that mechanical and circulatory factors account for the majority of gall-bladder lesions. Feinblatt⁸ holds that the role of infection as a cause of cholecystitis has been seriously overestimated. Branch⁵ believes that the organisms recovered from infected gall bladders do not necessarily constitute the primary etiologic factor in the development of acute lesions. The more recent studies of Andrews³ make it appear that the role of bacterial infection is indeed very minor. In quantitative studies he found as a rule no more bacteria in acutely inflamed gall bladders than in quiescent ones. Cultures taken from some of the severely damaged gall bladders were sterile. He states that in his experience empyema of the gall bladder has not been demonstrated by microscopic and bacteriologic studies. Denton⁹ and Feinblatt⁸ some years ago expressed similar ideas.

From the clinical point of view these findings are consistent with the course of many cases of acute cholecystitis. We have all operated on patients within forty-eight hours of the onset of pain and found gall bladders that appeared to be acutely inflamed, yet the fever, the white count, the general condition of the patient and the postoperative course were all consistent with a non-infectious lesion of the peritoneal cavity. In many respects the clinical picture of the early case of acute cholecystitis is identical with that of an early case of an ovarian cyst with twisted pedicle, and the course after operation in each case is much the same. Basically, the cause of these two conditions—an interference with the blood supply of an intraperitoneal viscus—is identical. In neither situation can the etiologic factor be considered a septic process.

If we agree that obstruction is first in the course of events in acute cholecystitis and is prerequisite to infection, it is obvious that immediate removal of the obstructed viscus before infection has occurred is the procedure of choice. The difficulties it presents are, first, the fact that in many cases there is a delay of several days before the surgeon is consulted, and secondly, that it is frequently impossible to decide from clinical study whether infection has been superimposed on obstruction.

Of the 29 patients with acute cholecystitis encountered since January 1, 1935, in private practice and in our service at the Massachusetts Memorial Hospitals, 1 was moribund on admission to the hospital, and died of perforation of the gall bladder and peritonitis. The other 28 patients were

operated on either early or late, and all recovered.

It is impossible to say exactly what constitutes an immediate operation for acute cholecystitis. In theory, it is best to operate on most cases within forty-eight hours of onset, but in practice we seldom have an opportunity to do so. The profession as a whole has not yet reached the position of recommending immediate surgery in this disease. In 12 of our 29 cases operation was performed four days or less from the time of onset. In all these patients the convalescence was easy and comfortable. High fevers and serious reactions were absent, and complications did not occur. These cases did not react postoperatively in any way like cases of abdominal infection. In 11 of these 12 cases the gall bladder was removed. In 1 patient, who was very short and extremely fat, the gall bladder was merely drained because of the technical difficulties of removal caused by her obesity.

In 16 cases, operation was performed from five to fifteen days after the acute attack. All these patients recovered, but several had a stormy convalescence, and some had serious postoperative complications. As a group they impressed us strongly as being much sicker and having a much more difficult time than did the patients who were operated on soon after onset. We removed the gall bladder in 13 of these 16 cases, in the other 3 it was drained because of perforation and abscess formation around it.

In our experience the delayed operation of cholecystectomy is definitely harder than the early one. In both there is much edema about the cystic duct and cystic artery, and their identification is difficult. In the early operation, however, the edema is not so fully organized and there is a less firm inflammatory thickening of these structures.

The postoperative course in our group of delayed operations was complicated in 2 cases by wound infections that required long stays in the hospital, and in 1 case by a subphrenic abscess that necessitated rib resection and drainage.

Perforation and abscess formation had occurred in 4 of our 28 operated cases (14 per cent). This figure approximates the figures for gangrene and perforation reported by other men in recent studies of larger numbers of cases. Kunath¹⁴ reports an incidence of 22 per cent and Heuer¹¹ one of 15.7 per cent. The high incidence of gangrene has not been sufficiently emphasized in the literature, and is a most important factor to be considered when deciding on the time for surgical treatment.

It had been our belief that stones in the common duct would rarely be found in acute cholecystitis,

since obstruction of the cystic duct was commonly present, and theoretically should prevent stones from entering. Among our operated patients, however, we found 5 who had stones in the common duct (18 per cent). Kunath¹⁴ reports that 7 per cent of his acute cases showed them. Only 1 of our stone cases showed jaundice, there were, however, 4 other patients who had jaundice but no stones in the common duct. This demonstrates once again that neither the presence nor the absence of jaundice is significant in regard to stones in the common duct.

Edema about the junction of the cystic and common ducts was repeatedly noted in this group of cases. Andrews³ believes that the slight jaundice seen in acute cases is caused by this inflammatory reaction and that this same phenomenon is responsible for the fever in certain cases of acute cholecystitis. He suggests that Charcot's intermittent fever may come from inflammatory obstruction of the common duct as well as from stones in it. In several of our patients who were operated on within forty-eight hours of the first pain, the gall bladder showed a tremendous increase in size, there was edema about an impacted stone at the junction of the cystic and common ducts, and there was a slight jaundice but no stone in the common duct. Immediate surgery in this type of case is safe, and will often rescue the patient from a long series of distressing complications.

We do not intend to enlarge upon the criteria by which to decide when to operate on late cases of acute cholecystitis. In the first place, we do not believe that specific data are available. All surgeons recognize fully that the pathology of this disease may be most deceptive, and that there is a very high percentage of error in correct diagnosis, particularly in the later stages. In general, our practice in late cases is to observe the patient for hours or days while giving him fluids and glucose. If we have evidence of spreading infection as suggested by a rising white-blood-cell count, a rising fever and a heightening pulse, we favor immediate drainage of the gall bladder. If it appears from our clinical impression and the above data that the infection is subsiding, we prefer delay and later operation.

SUMMARY

In this study of acute cholecystitis the advantages of the early operation have been emphasized. The basic lesion of acute cholecystitis is not infection, but obstruction to ducts and blood vessels, which produces edema, infarction and gangrene. The longer this process continues, the more chance there is for infection and its complications to develop. When the process can

be interrupted by immediate cholecystectomy, infection rarely occurs, complications are few, and the final results are very satisfactory.

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DISCUSSION

DR WALTER G PHIPPEN, Salem. I wish to report a case of acute cholecystitis which was undoubtedly indirectly caused by trauma. A leather worker, aged forty two, was crushed on his right side between heavy rollers. The immediate result was a ruptured right ureter with extravasation of urine, which filled the retroperitoneal space. This was drained in an appropriate manner. About ten days later the patient developed all the signs and symptoms of an acute cholecystitis, and at operation the gall bladder was gangrenous. The cystic artery had apparently been obliterated by pressure of the indurated edematous mass in the retroperitoneal space. The gall bladder was removed. Later the right kidney was removed and the patient made an uneventful recovery. Undoubtedly the cholecystitis was the indirect result of the trauma.

DR FRANK H LAHEY, Boston. Early operation has the additional advantage of permitting the correct diagnosis to be made in cases of acute pancreatitis that would be overlooked if operation were delayed. It is impossible at times to distinguish between acute pancreatitis and acute cholecystitis. In the beginning of our experience we felt as Dr Clute did, that is, we tended to delay operation but the more we see these patients the more we lean toward early operation. I believe that the trend in that direction, as indicated in the literature, is the result of the growing conviction that acute cholecystitis is somewhat, though

not entirely, similar to acute appendicitis. When patients can stand operation and the risk is justifiable, early operation is better than delay.

DR LELAND S McKITTRICK, Boston. I should like to add a word concerning our experience with the six or eight diabetic patients we have seen who have come in with a stone impacted in the ampulla and a superimposed infection. Whereas we expect most of these conditions in non-diabetic patients to quiet down and permit more deliberate surgery, quite the opposite seems to be true in the patient with diabetes. With but one exception all this small group have gone on either to local perforation or to gangrene and empyema requiring drainage. In view of this we now feel that it is probably unwise to delay operation in such patients in the hope that an interval cholecystectomy may be done, but that it is probably better judgment to go ahead with operation as soon as the patient's carbohydrate metabolism and fluid balance have been brought to a point consistent with safe drainage of the gall bladder. It is apparently only the exceptional diabetic patient with an acute process who will be in good enough condition to permit removal of the gall bladder.

DR ARTHUR W ALLEN, Boston. The title of the paper, Immediate Surgery in Acute Cholecystitis, seems to imply the possibility of emergency operations in the middle of the night and at variable intervals during the disease. A patient with an acute gall bladder may arrive at the hospital within forty eight hours after the onset of pain, or four or five days after it. A great many patients arrive in such a distressing state, with dehydration, and

so forth, that an emergency operation is extremely dangerous. If such a precedent is followed, the mortality will be high. I am sure Dr Clute does not wish to imply immediate, but rather early, operation.

I believe that it is almost never necessary to operate on such patients in the middle of the night, as one might, for example, in a case of acute gangrenous appendix. If they are kept in the hospital for a few hours and their fluid balance is put in order, they are very much more likely to be in a relatively safe operable state than they would be if operated on as an emergency procedure. Furthermore, many patients whom we watch for a few hours and treat in a conservative manner are so much better by the next morning that I believe we can afford to delay and choose our own time for operation.

DR JOHN HOMANS, Boston. I have learned something from this paper. Having always believed that acute cholecystitis was dependent upon the presence of a stone impacted near the outlet of the gall bladder, it has seemed to me very unlikely that a stone should also be present in the common duct even if the patient is jaundiced. However, I did see a patient the other day in whom I found small stones caught in the cystic duct, and who showed a type of acute cholecystitis rather different from the ordinary in that case I now realize that the common duct might well have harbored a stone.

I was much interested to learn that the percentage of stones in the common duct in acute cholecystitis is so high. This is a factor which I have never before heard emphasized.

THE PRESENCE OF HEMOLYSINS IN ACUTE HEMOLYTIC ANEMIA

Preliminary Note

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WITHIN a period of four months we have observed 3 cases of severe hemolytic anemia characterized by acute onset, rapid development of profound anemia, fever, slight to moderate icterus and slight to moderate splenomegaly. In the first 2 cases, the blood picture showed high color index, increased mean corpuscular volume, macrocytosis and nucleated red blood cells. The resistance of the red cells to hypotonic salt solution was normal. In the third case, the blood picture corresponded to that commonly seen in congenital hemolytic icterus, namely, microcytosis, spherocytosis, increased erythrocyte thickness, and greatly increased fragility of the red cells to hypotonic salt solutions. Neither large daily doses of concentrated liver extract given parenterally in the first case nor repeated transfusions of blood in all

the cases were of any therapeutic value. Splenectomy was, however, followed by prompt and dramatic response, complete recovery occurring in all 3 cases.

The hemolytic character of the anemia in these cases is demonstrated by the following laboratory criteria: bilirubinemia, absence of bile in the urine and increased urinary urobilinogen, together with the signs of greatly increased regenerative activity on the part of the bone marrow as evidenced by polychromatophilia, reticulocytosis, nucleated red blood cells, the presence of immature polymorphonuclear cells and hyperplasia of the bone marrow on direct examination at biopsy.

In performing compatibility tests with the serum of L G (Case 2), it was noted that hemolysis of the red cells of prospective donors frequently occurred. Numerous experiments were then performed which demonstrated the presence in the patient's blood serum of a hemolytic factor which was active against cells of all four blood groups

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normal control experiments being negative. On the appearance of the third case, tests for hemolysin again demonstrated the presence of a hemolytic factor active against the cells of all blood groups. The serum of the first case was then investigated and showed a similar, but weak, hemolytic activity.

METHODS

Fragility tests were done by the method of Daland and Worthley.¹ Urobilinogen was tested by the method of Wallace and Diamond.² The presence of hemolysins in the serum was determined by the following technique: 1 drop of fresh serum, 1 drop of a 5 per cent washed human red-cell suspension of the different isoagglutination blood groups and 1 drop of normal salt solution were mixed in 7 mm bore test tubes and allowed to stand at room temperature, or incubated at 37°C.*

Control observations using normal serums of various blood groups against the same red-cell suspensions were always made. In a few instances, the hemolytic titer of the serum was established by the following method: 0.5 cc. of 5 per cent suspensions of washed red cells, 0.5 cc. of 5 per cent guinea pig complement, 0.5 cc. of serum in successive dilutions, and 15 cc. of normal salt solution were mixed in 7 mm bore test tubes and incubated at 37°C for 1 hour.

Inactivation of serum was accomplished by heating in a water bath at 56°C for 30 minutes. Complement was obtained from guinea pigs by heart puncture; the blood was allowed to clot and the serum was pipetted off. The blood serums, which were kept at icebox temperature for varying lengths of time, were frequently tested for hemolytic activity.

The simple experiments for hemolytic activity were varied from time to time: the serum was kept in contact with its clot for several hours at 5°C, it was immediately chilled, it was mixed with human serum by the addition of 1 drop of homologous serum added to the hemolytic testing system.

CASE REPORTS

Case 1† H. L., an ice-company supervisor, aged 50, was admitted to the Waltham Hospital on May 19, 1937, complaining of increasing fatigue and weakness. The family history was entirely negative. There was a past history of peptic ulcer 6 years before, and intestinal grippe 4 months before. One month previous to admission the patient felt fatigue on exertion, which rapidly gave way to increasing weakness. Then followed edema of the legs, vomiting of bilious material and the passage of dark-colored urine. The patient's physician gave him large daily doses of liver extract parenterally, but when he failed to respond he was sent to the hospital. On admission he was obviously in desperate condition with extreme pallor, moderate icterus and orthopnea. There was no abnormality of the tongue, the edges of both the spleen and the liver could be felt three to four fingerbreadths below their respective costal margins, there was moderate pitting edema of the lower legs, the neurologic examination, including that of the vibration sense, was entirely negative.

*At the beginning of the studies in Cases 2 and 3 hemolysis took place almost immediately. Later it took place within an hour or more at room temperature, finally with the titer of hemolysins apparently diminishing hemolysis occurred only after incubation at 37°C.

†This patient was seen in consultation with Dr. Leo G. Blacklow to whom we are indebted for many courtesies.

The laboratory data are recorded in Table 1. In brief they showed marked anemia, apparently of the macrocytic variety, leukocytosis, evidences of marked regenerative activity of the marrow (polychromatophilia, reticulocytosis), nucleated red cells and polymorphonuclear leukocytosis, and the chemical findings of a hemolytic type of

Table 1 *Record of Case 1*

DATE	HEMO- GLOBIN (100% = 15.5 Gm.)	HEC	WBC	RETIC- ULO- CYTES	ICTER- US INDEX	REMARKS
1937	per cent	mil lions	thou sands	per cent	units	
5 19						Transfusion 750 cc. Fragility test 42-32. Concentrated liver extract 3 cc. (Lederle) daily intramuscularly.
5 20	43	1.63	18.4		30	MCD 7.55 microns
5 22	40	1.16	14.4	12		Transfusion 500 cc. Concen- trated liver extract (Led- erle) 6 cc. daily
5 26	30	1.15		22		Transfusion 500 cc.
5 27	30	1.40		22		
5 28	30	1.00		23		
5 31						SPLENECTOMY transfusion 950 cc.
6-1	41	1.82		20		
6-3	51	2.45		27	22	
6-8	56	2.77		17		
6-14	61	2.74		3.8		Transfusion 500 cc.
6-17	74	3.62		1.2		
6-25	79	3.67		1.0	10	Liver extract (Lederle) 3 cc daily
9 3	71	4.08	11.2	1.0	17.5	
11 17	89	4.21	17.4	0.1		

icterus (bilirubinemia, lack of bile in the urine and much bile in the feces). Because of the patient's condition he was immediately transfused with 750 cc. of blood, and treatment with concentrated liver extract (Lederle) was continued in dosages of 3 cc. daily. The patient grew progressively worse, however, and even with two more transfusions and an increase in the dosage of liver extract to 6 cc. daily, he finally became almost moribund. Splenectomy was thought justified as an emergency procedure. Before the operation was performed, however, it was thought essential to do a sternal bone marrow biopsy to rule out the rare possibility of hemolytic anemia due to malignant neoplasm. The biopsy showed extreme normoblastic hyperplasia, a picture differing strikingly from that of the megaloblastic marrow of pernicious anemia. Following two transfusions of blood on May 31, splenectomy under spinal anesthesia was done by Dr. H. Quimby Gallupe. The patient made a most dramatic and uncomplicated recovery, the erythrocyte count rising at first by about 200,000 cells daily. The spleen weighed 500 gm., and there were several large infarcts. The sections showed extreme congestion, extensive hemorrhages, thrombosis of veins and capillaries, and hemosiderosis, but no apparent proliferation of reticuloendothelial cells. In September, the patient presented the typical features of an attack of gallstone colic. In November, about 5 months after splenectomy, he was in excellent condition and ready to resume his occupation. The question of hemolytic activity of the serum was not investigated in this patient until more than 3 months after splenectomy, at which time a weak hemolysin was demonstrated.

Case 2‡ L. G., a 38-year-old Italian American housewife, was admitted to the Cambridge Hospital on July

‡We are indebted to the visiting physicians of the Cambridge Hospital for the opportunity of studying this case.

17, 1937, complaining of increasing weakness. The family history was essentially negative. In 1934 cholecystectomy had been performed at another hospital for cholecystitis and cholelithiasis. At that time evidence of slight anemia was discovered. The patient was followed in the outpatient department of this hospital, where diagnoses of secondary anemia, cause unknown, and of hypothyroidism were made. Three weeks before entrance to the Cambridge Hospital she began to complain of weakness, which grew rapidly worse, in turn she developed dyspnea, palpitation and increasing pallor, and passed dark-colored urine. Examination on admission showed marked pallor with moderate icterus, a normal appearing tongue, a large spleen extending three or four fingerbreadths below the left costal margin, and a negative neurologic examination. The laboratory data are recorded in Table 2. Except for the presence of a normal or

to drop. On August 31 it was thought desirable to give parenterally 3 cc. of liver extract (Lilly concentrated) daily and iron in the form of ferrous sulfate, 1 gm. daily. Recovery continued uneventfully and on November 17, more than 3 months after splenectomy, the patient was in excellent physical condition and with normal blood findings.

In testing the patient's serum against the blood cells of prospective donors, it was noted that hemolysis frequently occurred. This was the occasion for testing the serum for hemolytic activity. A large number of experiments were performed as outlined above. These demonstrated in the serum a hemolytic factor which was active against red cells of all the blood groups, although in different degrees and with much individual variation (Table 4). Definite evidence for the presence of an autohemolysin was not demonstrated by the methods outlined above, but

Table 2 *Record of Case 2*

DATE	HEMO- GLOBIN (100% = 15.5 gm.)	RBC	WBC	RETICULO- CYTES	ICTERUS INDEX	CRONIL INOXEN	REMARKS
	per cen	millions	thousands	per cent	units	dilution	
1937 7-17	23	1.21	6.2				Gastric analysis—free HCl 24 units. Conc. liver extract (Lilly) 3 cc intramuscularly every 2 days.
7-26	20	1.00	4.6		25		
7-29		.97		20.8			MCV 125 cu. microns. MCD 7.44 microns. Transfusion 500 cc.
7-30					22.5	1:80	Transfusion 500 cc.
7-31							Transfusion 500 cc.
8-2	30	1.28	6.2	10.4			Transfusion 750 cc.
8-4	53	1.59	4.1	14.2			SPLENECTOMY transfusion 1200 cc.
	57	2.33	8.2	7.3			
8-9	57	3.75	15.0		10.0	1:40	Fragility test 44-37
8-11						1:10	
8-16	55	3.06	16.8	9.7			Transfusion 500 cc.
8-17					12.5	1:80	
8-19	57	3.82		8.8			
8-20					9.0		
8-23						1:40	
8-26	58	3.23	7.6	5.5	10.0	1:40	
8-28	49	2.79	11.5	8.2			Transfusion 500 cc.
8-30	59	3.06	9.6	5.8	11.25	1:70	
8-31							Liver extract 3 cc. FeSO ₄ 1 gm.
9-4					7.0		
9-8	63	3.35	8.4				
10-4					10.0	1:70	Discharged. Fragility test 44-26
10-7	66	4.13	9.4	3.9			
10-20	76	4.31					
11-17	85	4.78	6.9	1.3	6.25		Fragility test 42-20

somewhat diminished leukocyte count, the blood findings were almost identical with those of Case 1, and the urinary and blood chemical findings were those of a hemolytic type of icterus.

The patient was given two 3 cc. doses of liver extract (Lilly) intramuscularly, but showed no evidence of response. A bone marrow biopsy revealed intense normoblastic hyperplasia without evidence of pernicious anemia. On July 29 the patient was transferred to the Beth Israel Hospital, where she was given four transfusions of blood in 5 days without definite effect on the blood picture or the clinical status. The hemoglobin ranged between 20 and 30 per cent, and the erythrocyte count between 970,000 and 1,280,000. Splenectomy was therefore performed under spinal and cyclopropane anesthesia on August 4, the patient receiving 1200 cc. of blood during the day. There was an almost immediate and dramatic recovery, although the postoperative course was complicated by consolidation of the left lower lung. Two more transfusions of blood were given when the blood picture showed some tendency

when the serum was allowed to remain in the icebox in contact with its clot for 48 hours there was evidence of some hemolysis.

The spleen weighed 500 gm. It was characterized microscopically by relative diminution in size of the Malpighian corpuscles, with marked increase in cellularity of the pulp and the presence of many large irregular cells and occasional giant cells with multiple nuclei (reticuloendothelial hyperplasia). Hemosiderin was greatly increased, and there was definite evidence of erythrophagocytosis. A study of impression preparations of the spleen gave evidence of myeloid activity, with many myelocytes and nucleated red cells. Extracts of the spleen, which are now being further investigated, showed definite hemolytic activity.

Case 3 G. C., a 44-year-old, married, Jewish housewife, with a negative family and past history, was admitted to the Beth Israel Hospital on August 27, 1937, complaining of weakness. She had been well until 5 days previously, when she had developed fatigue and malaise. On the

next day, pallor and fever had been noted, 2 days before admission she had become prostrated. She walked into the hospital ward, with assistance, but a few hours later was semimoribund with an extremely rapid pulse, a temperature of 103°F and dyspnea. There was marked pallor, and moderate icterus. The tongue was normal, neither the liver nor spleen could be felt, the neurologic

tracts of the spleen, which are now being further investigated, showed definite hemolytic activity.

In this patient's serum a strong hemolytic factor was found which corresponded closely in its reactions to that of Case 2. Hemolysis was induced with cells of all blood groups (Table 4), and in addition an autohemolysis was demonstrated. Upon the addition of 1 drop of homologous

Table 3 *Record of Case 3*

DATE	HEMO- GLOBIN (100% = 15.5 Gm.)	ABC	WBC	RETICU- LO- CYTES	NUC. RBC (PER 100 WBC)	ICTERUS INDEX	UROBIL- INOGEN	REMARKS
	per cent	millions	thousands	per cent		units	dilution	
1937								
8-7	22	1.51	20.1	20.6	36	37	1.80	MCV 80 cu. microns MCD 6.4 microns Cell thickness 2.5 microns. Transfusion 1150 cc
8-28	34	1.90		16.1			1.60	Fragility test 72-44 hemoglobinuria transfusion 500 cc
8-29								SPLENECTOMY transfusion 1700 cc.
8-30	36	2.12		16.7	82	27.5		
8-31								Transfusion 500 cc
9-2	43	1.93	24.7	10.0	60		1.80	Transfusion 500 cc
9-3	50	2.76	17.2	6.4		22.5		Fragility test 74-28
9-9	31	1.75		15.5		22.5	1.40	
9-10								Transfusion 500 cc
9-11	38	2.02	31.5	17.7	30			
9-12								Liver extract (Lilly concentrated) 3 cc daily FeSO ₄ 1 gm. daily
9-14				17.5				Transfusion 300 cc
9-16	42	1.75	15.2	17.0	41	35	1.20	
9-21	45	1.85		31.6		22.5	1.10	
9-27	47	2.15	11.7	20.8	18			
10-9	68	3.04	9.1	13.1		10		Fragility test 70-34
10-10								Discharged
10-26	71	4.00						
11-17	77	3.94	14.2	0.9		6.25		Fragility test 44-18

examination was negative. The blood (Table 3) showed marked anemia, with polymorphonuclear leukocytosis and many normoblasts. The striking features of the blood picture were large numbers of very thick looking microcytes (spherocytes). The fragility test was grossly abnormal, hemolysis began in a 0.72 per cent salt solution and was complete in a 0.44 per cent solution. The features of a hemolytic type of icterus were present. Seventeen hundred cc of blood was given during the course of the day. The patient failed to respond, and indeed became worse. A severe transfusion reaction developed with the passage of large amounts of urine containing hemoglobin and with an increase in icterus. She was transfused again, however, on the following day, but since there was no change, either clinically or hematologically, splenectomy was performed under ethylene-ether anesthesia. There was immediate clinical response, with quick loss of the previous toxic appearance, a diminution in icterus and a fall in temperature. Several transfusions were given postoperatively, on two occasions it was noted that icterus became increased after transfusion. Convalescence was rather slow and was characterized by slight fever, continued anemia and many nucleated red cells in the peripheral blood. Because of the possibility that a depletion of maturation and other blood forming substances might be occurring, 3 cc. of parenteral liver extract (Lilly, concentrated) and 1 gm. of ferrous sulfate were given daily beginning September 12. Convalescence occurred rapidly and the patient was discharged October 10. More than a month later (November 17), although she seemed clinically well, there was slight anemia and leukocytosis.

The spleen, which had been adherent to the diaphragm and therefore not palpable, weighed 360 gm and microscopically showed extreme congestion of the sinusoids, without hemosiderosis and without evidence of erythrophagocytosis. The splenic corpuscles were well marked. Ex-

amination of the human serum to the hemolytic test system described above, hemolysis was definitely inhibited.

With continued improvement after splenectomy, the hemolytic factor gradually became diminished, the spherocytes gradually disappeared and the fragility test finally became normal.

SUMMARY OF CASES

All the patients became acutely ill, with weakness as the outstanding symptom. In Case 3 the

Table 4 *Summary of Tests for Hemolytic Activity of Suspected Serums*

SERUM	BLOOD GROUP OF PATIENT'S SERUM*	BLOOD GROUP OF TESTING CELLS	NUMBER OF EXPERI- MENTS	NUMBER WITH POSITIVE HEMOLYSIS
Case 1	O	AB	0	—
		A	1	0
		B	2	0
		O	3	1
Case 2	O	AB	9	7
		A	11	5
		B	12	4
		O	19	6
Case 3	B	AB	—	—
		A	20	15
		B	20	10
		O	35	27

* International nomenclature. Blood Group O=Type IV. Moss. A=Type II. Moss. B=Type III. Moss. AB=Type I. Moss.

course was a precipitate one. Anemia developed rapidly and was associated with moderate icterus. The spleen was readily felt in the first 2 cases. Since pernicious anemia was the initial diagnosis in those cases, it was of interest to note the normal appearance of the tongue, the absence of neuro-

logic phenomena and the presence of free hydrochloric acid in the gastric juice. The blood picture was similar in the first 2 cases, being characterized by the presence of polychromatophilic macrocytes and an increase in the mean corpuscular volume, but by a normal, average red-cell diameter. Microcytosis was not striking, and the fragility test was normal. In the third case, spherocytosis (the presence of thick microcytes) was outstanding and was associated with a grossly abnormal fragility test. The jaundice was of the hemolytic variety with increased bilirubin of the indirect variety, acholic urine and increase in urinary urobilinogen.

In none of the cases were transfusions of any benefit. In fact on several occasions the reverse was true, definite evidence of increased blood breakdown occurring after transfusion. An adequate trial with large doses of parenteral liver extract in Case 1 failed to show any therapeutic results. Splenectomy performed as an emergency measure, with the patient in each case semimoribund, produced immediate therapeutic effect.

Experiments for hemolytic activity of the serums in these cases demonstrated the following (Table 5) pronounced hemolytic activity against cells of

Table 5 *Summary of Characteristics of Hemolytic Activity of Serums (Cases 2 and 3)*

STATE OF SERUM	BLOOD GROUPS OF RED CELLS TESTED			
	AB	A	B	O
Fresh serum	H	H	H	H
Fresh serum—after incubation with normal human serum	O	O	O	O
Fresh serum—after standing at 5° C for 15 hours	H+	H+	H-	H-
Fresh serum—after prolonged standing at 5° C	H-	H-	H-	H-
Heated serum—56° C for 1 hour	O	O	O	O
Heated serum—after addition of guinea pig complement	H	H	H	H

In all experiments 1 drop of serum, 1 drop of normal salt solution and 1 drop of a 5% suspension of red cells were used.

H=hemolysis

O=no hemolysis

H+=hemolysis more marked than with fresh serum

H-=hemolysis less marked than with fresh serum and gradually diminishing

all blood groups, including those of Group O. definite evidence of autohemolysis in Case 3, inactivation of hemolysis by heating the serum to 56°C, with re-establishment of activity upon the addition of guinea pig complement, increase in hemolytic activity of the serum when it was kept at icebox temperature overnight, gradual diminution in hemolytic activity with prolonged standing at icebox temperature, diminution of hemolytic activity when the serum was incubated with its clot, suppression of hemolytic activity upon incubation at 37.5°C with normal human serum before the red cell suspension was added, incomplete inhibition of hemolysis when the serum was mixed with normal human serum and allowed to

stand at room or icebox temperature before addition of the testing cells, and finally, an individual variability in the hemolytic susceptibility of cells from different subjects of the same blood group.

The microscopic picture of the spleen differed in all 3 cases, congestion and multiple thromboses being present in Case 1, reticuloendothelial proliferation and erythrophagocytosis being the outstanding features of Case 2, and simple congestion of the pulp characterizing Case 3. Extracts of the spleen were made in Cases 2 and 3, and various fractions showed a marked hemolytic quality.

DISCUSSION

Since 1925, the date of Lederer's first report on "acute (febrile) hemolytic anemia,"² over 50 cases of this syndrome have been reported. In 1909 Chauffard and Vincent,¹ in a thorough study almost completely neglected in the literature, described under the title "Hémogloburie hémolytique avec ictère polycholique aigu," a case of acute hemolytic anemia corresponding clinically and hematologically in every respect to what is now frequently called Lederer's anemia. What is more, Chauffard and Vincent demonstrated in their case the presence of a very active hemolysin in the serum, which was "precocious" in type, intense in action, not secondary to blood destruction but apparently the cause of it, and of endogenous origin. It appears that in none of the cases of acute hemolytic anemia reported since the work of Chauffard and Vincent has an hemolysin been investigated, although some speculations have been made regarding its presence, and regarding the possible antilytic value of blood transfusion. In a few cases, an autoagglutinin has been found.

Our own findings are quite similar to those of Chauffard and Vincent, although because of present-day knowledge of the blood groups we have been able to extend them. The unusual activity of the hemolysins, which appear to be of endogenous origin, and which were found to possess a strong lytic action upon cells of their own type as well as upon those of Group O, serves to set them apart from the known isohemolysins. The latter are occasionally discovered in the course of isoagglutination compatibility tests done prior to transfusion. We have observed 2 such cases. As Wiener³ points out, isohemolysins of this type correspond in specificity to the isoagglutinins normally present in the serum. The commonest isohemolysin is of the alpha type, and is usually present in Group O serum, which contains alpha and beta agglutinins (and hemolysins). So far as we are aware, no hemolysin has yet been reported which is active against Group O cells, which indeed are theoretically incapable of being hemolyzed by isohemolysins.

The antilytic action of normal human serum as demonstrated in our experiments may have some bearing upon the therapeutic value of blood transfusions, which have usually been curative in acute hemolytic anemia albeit in several cases splenectomy has been required. The gradual diminution in activity of the hemolysins, with continued recovery of the patients, makes possible a causal relation between the hemolysin and the development of the hemolytic syndrome. The presence of large numbers of spherocytes in Case 3, with their subsequent diminution in association with diminution in titer of the hemolysin, indicates that the spherocytes and the hemolytic factor were closely related. In other words, it is possible that the hemolysin was the direct cause of the development of spherocytes. Certain experiments which will form the basis of another paper tend to confirm this speculation.

Acute hemolytic anemia may be related to paroxysmal (cold) hemoglobinuria, to paroxysmal nocturnal hemoglobinuria (Marchiafava⁶), to acquired hemolytic icterus,⁷ to hemolytic splenomegaly (Banti⁸) and even to congenital hemolytic jaundice. Studies now in progress in the latter disease have demonstrated hemolysins in 2 cases.

Although most cases of acute hemolytic anemia appear to respond effectively to transfusions, occasional cases, it must be remembered, are so severe that the more radical measure of splenectomy must be employed. This may be a life saving measure.

SUMMARY

In 3 cases of acute hemolytic anemia failing to respond to transfusion but responding dramatically to splenectomy, hemolysins of unusual activity were demonstrated. Since the hemolysins were active against red cells of Group O and their own type, they fail to correspond to any hitherto described hemolysin. Furthermore a hemolytic factor was demonstrated in splenic extracts of 2 of the 3 cases.

From this preliminary paper no definite conclusions can be drawn, but the evidence already at hand suggests that the hemolysin was causally related to the development of the disease, that it was of endogenous origin, and that it was the causative factor for the presence of spherocytic microcytes in the third case. These hypotheses are now under investigation.

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CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITALANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

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CASE 24021

PRESENTATION OF CASE

First Admission A fifty-six-year-old Italian housewife entered the hospital because of left flank pain of one day's duration.

On the day before entry she rather suddenly developed steady aching pain in the left lumbar region which spread forward to the left lower side of the abdomen but not down to the genitalia. She felt feverish, but had no chills. She had no bloody urine, frequency, dysuria or other urinary symptoms.

For the previous ten years she had moderate dyspnea on exertion and moderate orthopnea, so that she used three pillows while sleeping. She had no edema, chest pain, cough or hemoptysis, but did have occasional night sweats. She took ten drops of a brown alcoholic medicine three times a day for this "heart trouble." Her past history was otherwise negative. Her family history was noncontributory.

Physical examination revealed a feverish, rather obese woman apparently suffering some pain. Her heart was enlarged to the left, 1 cm. beyond the left midclavicular line. The rhythm was grossly irregular, and there was a diastolic apical murmur with a loud first sound. The apex rate was 100 and the radial rate 92. The blood pressure was 120 systolic, 80 diastolic. The abdomen showed moderate left lower quadrant and left costovertebral tenderness.

The temperature was 100°F., the pulse 92. The respirations were 20.

The urine had a specific gravity of 1.014, contained 4 white cells per high power field, but was otherwise negative. The blood showed a red-cell count of 4,500,000 with 90 per cent hemoglobin and a white-cell count of 14,800. The urine culture was negative.

X-ray of the abdomen showed the left kidney markedly enlarged and the right kidney fairly small. There were no unusual areas of calcification visible in the region of the kidneys. An intravenous pyelogram showed that the dye was excreted promptly by the right kidney and not at all by the left. The right kidney pelvis, calices and ureter appeared normal. A retrograde pyelo-

gram showed no evidence of disease in the left kidney pelvis and calices.

For the first week after entry the temperature remained elevated, fluctuating between 100 and 102°F., but on the eighth day the chart became flat. On the fifth day a urine culture contained *Bacillus coli*. On the tenth day another intravenous pyelogram showed the same findings as before. A chest plate showed the transverse diameter of the heart definitely increased. There was also increase in size across the base, but the greatest prominence was downward to the left in the region of the ventricle. She was discharged on the fifteenth day.

Second Admission (five days later) She felt well for four days after discharge, except for slight burning on urination. On the fifth day, while urinating, she suddenly had a very severe pain in her right costovertebral angle and re-entered the hospital two hours later.

Physical examination revealed marked right costovertebral tenderness. The heart findings were essentially the same as on the previous entry, and her blood pressure was 120 systolic, 90 diastolic.

The temperature was 100°F., the pulse 96. The respirations were 20.

The blood gave a red-cell count of 4,690,000 with 70 per cent hemoglobin, and a white-cell count of 28,900, 98 per cent polymorphonuclears. An x-ray of the abdomen revealed no appreciable change from the previous examination. The costovertebral pain persisted and she remained completely anuric until the third hospital day, when she passed about 200 cc of urine which showed a specific gravity of 1.012 and a trace of albumin. It contained many white cells, but no red cells or casts. By that time she had become somewhat drowsy and was vomiting occasionally. Her temperature had risen to 102°F., and her white-cell count to 42,000. On the following day the nonprotein nitrogen of the blood was 87 mg per cent. Her temperature fell to normal, where it remained until death, and her white-cell count fluctuated between 14,000 and 28,000. On the fifth day she passed no urine, but on the following day catheterization produced 1300 cc., which showed a specific gravity of 1.010 and a slight trace of albumin. It contained many white cells and from 5 to 10 red cells per high-power field, but no casts. The stool on that day gave a 3+ guaiac test. Her condition had improved somewhat, and she appeared to be mentally clearer. However, on the seventh day her nonprotein nitrogen was 105 mg per cent. She passed about 500 cc of urine on that day and about 600 cc on the following day. On each day the urine had a specific gravity of about 1.012 and contained albumin, there were many white cells, but no red

cells or casts For the last three days she was in coma, and she died on the tenth hospital day

NOTES ON THE HISTORY

DR RICHARD C CABOT We have then, from the history alone, a person with a cardiac history of ten years who, though she has not been very well, seems to have been well enough to get around up to the very day before she came here, when she suddenly had pain in the left flank That is all we know The question is whether we can connect these two things

The urine was negative, and of especial interest is the fact that it contained no blood The x-ray examination showed a fairly small right kidney I take it they did not mean that it was abnormally small "There were no unusual areas of calcification visible in the region of the kidneys" In other words, there is no reason to think of stones

One of the questions we have to consider is why she was discharged, in view of the fact that she died so promptly soon after My guess is that they did not have much to offer in the way of treatment, and that the patient was restless and wanted to go home

At the second admission she had pain in the *right* costovertebral angle Nothing is said about pain in the left side at this time The white-cell count was 28,000 You remember that it was 14,000 at the last admission

The most important thing we have to face is the fact that she was in the hospital three days and passed no urine

DIFFERENTIAL DIAGNOSIS

This is a ten-year cardiac story with no cardiac symptoms There was no edema, and nothing in the lungs Her heart was doing fairly well in spite of absolute arrhythmia First she had left-sided and then right sided severe pain, associated with anuria, pyuria and a rising leukocyte count The only sure thing in any other part of the body is the guaiac test which showed something in the intestine, otherwise we have nothing to call attention to any other organ except the heart and the kidney

Let us consider the heart Here is a woman of fifty-six, an Italian, that means she is older than most people of our race at that age She has a heart that may perfectly well be that of mitral stenosis and could conceivably be due to other types of disease, but they are not so probable, I should say Her heart is enlarged, especially the base and the left ventricle, and she has what is called a diastolic murmur, not further characterized, at the apex, a sharp first sound and absolute arrhythmia—those things fitting together to make

us think of mitral stenosis It is queer, at fifty six, that she had had no symptoms until within ten years, but of course not at all unprecedented

If it was not mitral disease, what could it be? She has low blood pressure There is nothing to suggest the hypertensive types of heart trouble The heart was not so much enlarged as one would suppose it would be if she had had hypertension

Now that certainly is not the whole of it She also has had night sweats from time to time If she were French, I should think less of that—French people have night sweats a good deal of the time without any good reason that I can think of The night sweats suddenly link up with the fever she had here on two occasions The fever, however, was not lasting In both cases the temperature flattened out Nothing makes us think of tuberculosis of the kidney, except the fact that the organ is enlarged She never passed pus She has never had the bladder symptoms that usually go with a tuberculous kidney We have nothing to make us think of malignant disease or cystic kidney, which is ordinarily bilateral Embolism—first left and then right—seems to be the only thing one can say, and the only thing that displeases me is that it is so plain Long experience has taught me that if a diagnosis is perfectly easy, it is usually wrong I doubt if I can do better than that, however It seems to me that she had embolism first of the left and later of the right kidney, and died from anuria subsequent to the shutting off of kidney function There is no evidence of nephritis I see no reason why we should think of that from anything given here

Were the emboli septic or were they bland? They could be bland from a ball thrombus in the left auricular appendage with mitral stenosis, and we certainly can have fever and leukocytes with bland emboli On the other hand I have never seen a blood-leukocyte count of 41,000 with bland emboli, and it seems to me that the suddenly increasing white count suggests that the emboli were septic Septicemia was not the main cause of the death, however, it seems to me, but rather the cutting off of the blood supply and suppression of kidney function secondary to it But at least septicemia, if there was one, helped

I should suppose, then, that there had been a bacterial endocarditis on the mitral valve, not elsewhere in the heart I suppose there was an old mitral stenosis back of that The heart was not greatly enlarged, only moderately, as we should expect with mitral disease I see no reason to suppose anything wrong in the lungs or other organs except the kidneys But there is one problem that bothers me If she is throwing septic emboli into the kidneys, why not somewhere else? I cannot answer that It is against my diagnosis However,

it does not seem enough to suggest any alternative diagnosis. There may have been an embolus in the intestinal tract, though we have nothing but a guaiac test to back that up. In these cases at post-mortem we often find emboli in various organs although there was no suggestion of them during life. If there were emboli in the kidneys, I believe there were emboli elsewhere. Whether the autopsy was complete enough—Dr Mallory has told me that it was not complete—to show that, I do not know. I do not believe she would throw them only into the kidneys. The best diagnosis I can make is bacterial endocarditis on top of old mitral stenosis, with embolism, certainly septic embolism, of both kidneys.

DR GEORGE W. HOLMES: This x-ray film shows a distinct difference in the size of the kidneys. The left is nearly twice the size of the right. It is not particularly abnormal in shape. There is a suggestion at the border of a slight amount of lobulation, but it is not the kidney of cystic disease or tumor. With the intravenous dye there is evidence of non-function. We have then a large non-functioning kidney on the left with a normal kidney on the right. When the retrograde pyelogram is taken we find no dilatation of the kidney pelvis, no dilatation of the calices and no evidence of obstruction in the ureter. We now have a non-functioning kidney not due to obstruction in the ureter or pelvis, with no thinning of the cortex of the kidney such as one would expect with hydronephrosis. When we study the outlines of the calices and the pelves I should say they were normal—not enough variation to make a diagnosis of tuberculosis or even pyelitis, although I know that pyelitis may exist without x-ray evidence. We shall have to explain this absence of function on something very similar to what Dr Cabot has suggested.

DR CABOT: How about the right kidney? At the second entry she had pain on the right.

DR HOLMES: We have no examination at the time of the second entry, so far as I can tell, it was normal at the time of the first.

DR FULLER ALBRIGHT: I saw this patient only on the second admission. The one thing that disturbed us was why she had emboli going to both kidneys and nowhere else. We developed a fantastic theory about that. We thought that she had emboli to the left kidney first, which caused thrombosis of the left renal artery, and which subsequently backed up into the aorta and extended over into the opening of the other renal artery. We felt that she did not have bacterial endocarditis. We thought the emboli were aseptic. As a matter of fact she had a blood culture that was negative, I believe.

CLINICAL DIAGNOSES

Rheumatic heart disease with mitral stenosis and auricular fibrillation
Bilateral infarction of the kidneys
Uremia

DR CABOT'S DIAGNOSES

Old mitral stenosis probably with bacterial endocarditis
Septic emboli in both kidneys

ANATOMIC DIAGNOSES

Bland emboli to both renal arteries
Bilateral renal infarction

PATHOLOGICAL DISCUSSION

DR TRACY B. MALLORY: I think one of the difficult things in these clinical discussions is to bring oneself to make a diagnosis that seems obvious, and I might say that on years of experience Dr Cabot is one of the few who has consistently had the courage to do that. The diagnosis was primarily what he suggested—bilateral renal embolism. We found multiple infarcts of varying ages in both kidneys, the ones on the left being distinctly older than those on the right, but within each kidney there were infarcts of somewhat varying age.

Unfortunately the autopsy was limited to the abdomen so we could not see what the heart valves showed. Whether there was a bacterial endocarditis or simply an old rheumatic stenosis, we could not check with certainty. We could see from examination of the kidneys that these emboli were certainly not frankly septic. In other words there could not have been a bacterial endocarditis with a pyogenic organism such as a streptococcus or pneumococcus. I think we can guess a little further and say that it was probably not a bacterial endocarditis. In the kidney tissue between the infarcts, and there were a significant number of uninfarcted areas, we did not find the lesion which is so characteristic of *Streptococcus viridans* endocarditis, so-called embolic nephritis with individual glomerular lesions. That does not absolutely rule out bacterial endocarditis, it simply is of inferential value.

We were surprised at the autopsy—as Dr Cabot and Dr Albright were from the clinical course—that there was no evidence of embolism elsewhere. We did not have permission to examine the head but the spleen, the other abdominal organs and the gastrointestinal tract were all entirely negative and the only evidence of embolism that was found was in the kidneys.

DR BRAILEY Is it not peculiar that she had these two dramatic episodes of pain and that the kidneys should shut down on the basis of multiple emboli?

DR MALLORY We have seen pain and complete suppression of urine with renal infarcts before. I think they usually have been very massive ones. We have, I am sure, seen a white-cell count go as high as 40,000 with bland infarction.

DR. CABOT There was no embolus in any of the big vessels?

DR MALLORY One large embolus was found lying nearly free in the right renal artery, but it had not completely occluded it. On both sides there were multiple occlusions of small arteries.

A PHYSICIAN What was the explanation of one kidney being so much larger than the other?

DR MALLORY That was at the first examination, when only the one kidney was involved.

DR CABOT At autopsy they were nearly the same size?

DR MALLORY Yes.

DR CABOT And both large?

DR MALLORY Yes.

CASE 24022

PRESENTATION OF CASE

A twenty-four-year-old white Greek housewife entered the hospital with a complaint of cough and fever of nine days' duration.

Nine days before entry she awoke in the morning with a headache and dizzy feeling. During the day she felt feverish and passed frequent, small amounts of cloudy urine. That evening she had a severe chill and perspired profusely. Her physician examined her urine and told her she had an infection in her kidney. He gave her some pills, and her condition improved somewhat in the next few days. The urinary symptoms lasted three or four days. The temperature continued to be elevated and she had mild intermittent pain just under the left ribs. Six days before entry she began to have moderately severe, sharp, pulsating pain in the lower right anterior chest which was not influenced by breathing. The following morning she developed a dry cough and sore throat. Her fever increased and she soon began to raise dark black tenacious sputum, which was not blood streaked. The day before admission she developed a "fever blister" on her upper lip, and she also became somewhat dyspneic. She had had her last menstrual period seven weeks before entry and in the weeks before entry had some morning nausea and vomiting.

The family history was negative except that one brother had tuberculosis and was in a sanatorium. She had very infrequent colds and no previous car-

diorespiratory symptoms. Nine months before entry just after the birth of her second child she had urinary symptoms lasting a week similar to those in her present illness. She had had two normal pregnancies, the first child dying of "meningitis" at the age of eight months. The past history was otherwise negative.

Physical examination revealed a well-developed, well-nourished, not acutely ill, somewhat dyspneic, perspiring female. Examination of the chest was negative except for increased voice sounds in a small area posteriorly between the angle of the scapula and the lower dorsal ribs on the right. The blood pressure was 120 systolic, 90 diastolic. Pelvic examination revealed bluing of the introitus and a soft patulous cervix.

The temperature was 103°F, the pulse 120. The respirations were 24.

The urine had a specific gravity of 1.010 and contained 5 to 10 white cells per high-power field in the sediment. The blood showed a red-cell count of 4,270,000 with 80 per cent hemoglobin. The white-cell count was 20,200, 84 per cent polymorphonuclears. No tubercle bacilli were found in the sputum on repeated examination, and the stools were negative. The blood-serum chlorides were equivalent to 87 cc N/10 sodium chloride. Blood cultures were twice negative, and a sputum culture contained many hemolytic streptococci. A blood Hinton test was negative.

An x-ray of the chest revealed an area of cloudy consolidation in the second right interspace, particularly around the hilus. The lung fields were otherwise clear. The costophrenic angles were clear, and the heart was not remarkable.

On the day after entry the temperature rose to 105°F and the respirations to about 40. She became slightly cyanotic and was put in an oxygen tent. On that day she had an attack lasting about ten minutes in which she became disoriented and moved her right arm convulsively. The temperature at the time was 106°F. For the next week the temperature remained high, never falling below 101 and often rising to 105°F. On the fourth day she complained of headache, stiffness of the neck and some inability to use the right leg, but no reflex changes. Examination of the chest was essentially the same as before. On the following day she suddenly began to pass red blood and clots from her vagina. She bled freely, but her general condition remained unchanged. After a few hours she expelled an intact placenta and was immediately given pituitrin and ergot. The blood pressure remained unchanged and the bleeding lessened considerably. On that day she had another cerebral attack similar to the previous episode and lasting a few minutes. Her head turned to the right, her eyes rolled about, and her right arm

moved in tonic contractions. However, she did not lose consciousness. Neurological examination revealed no cranial nerve involvement. The neck was moderately stiff, but the Kernig was negative. There was marked weakness of the right arm with decreased activity of its reflexes. No sensory changes could be made out. A lumbar puncture was performed, but only a few cubic centimeters of bloody fluid could be obtained. The respiratory and pulse oscillations were fair, and the initial pressure was 150. The spinal fluid contained 25,000 red cells and 2100 white cells per cubic millimeter, with 68 per cent polymorphonuclears and 32 per cent lymphocytes, 198 mg per cent of protein and 38 mg per cent of sugar. No tubercle bacilli or other bacteria were seen on direct smear.

Three days later, on the ninth hospital day, she became somewhat drowsy, her neck became stiffer, and the Kernig was positive. Otherwise, the neurological examination was essentially the same as before. A lumbar puncture yielded only 1 or 2 cc. of bloody fluid. The vaginal discharge, which had been scant, increased in amount and became foul smelling. The blood at that time showed a red-cell count of 3,650,000 with 60 per cent hemoglobin. The white-cell count was 19,500, 90 per cent polymorphonuclears. An x-ray of the chest the following day showed the area of increased density in the region of the right hilus to be slightly smaller than before, and its upper portion seemed somewhat less dense, suggesting cavitation. Neurological examination revealed that she had developed a definite right facial lesion of the central type. She was started on prontosil in a dosage of 80 gr daily, and the temperature dropped quite sharply to 99°F., without change in pulse or respirations. However, it rose slightly the next day, and the following day, which was the eleventh hospital day, it reached 104°F. It remained at about that level until death. The serum chlorides of the blood were equivalent to 98 cc of N/10 sodium chloride. The carbon-dioxide combining power was 44.5 vol per cent. On the thirteenth hospital day she developed a right external strabismus, and her right leg became flaccid. She was given a clysis of 1000 cc of 2.5 per cent dextrose in saline with 100 cc of prontosil, and on the following day a clysis of 1000 cc of dextrose and saline with 200 cc of prontosil. She died that day.

DIFFERENTIAL DIAGNOSIS

DR ALFRED O LUDWIG. The onset of this patient's illness certainly suggests that she had some acute infectious process, since it was marked by headache, fever and chills, as well as by sweating. The urinary symptoms and her physician's statement of the examination of the urine would lead one to believe that he was correct in making the

original diagnosis of a urinary infection. This might well have been pyelitis and cystitis. Three days after the onset we first hear of chest pain situated in the right anterior chest, and this, as it is recorded here, does not suggest a pleuritic type of pain since it was not associated with breathing. One wonders whether possibly the pain was associated with something under the diaphragm, with a rather unusual reference of pain to the lower anterior chest. Soon afterward the patient began to develop respiratory symptoms in the nature of cough and sore throat. The development of herpes would be consistent with almost any infection associated with high fever, but is perhaps more commonly seen with the high temperatures during the course of pneumonia and very often with meningococcal meningitis. The onset of dyspnea also suggests that there has been some extension of the process to the patient's chest. The menstrual history associated with what we learn later in the history makes a diagnosis of pregnancy quite evident.

In the patient's past and family history it is significant that she had one brother who had tuberculosis, but we are not told whether she was in contact with him. It is interesting that the patient also had urinary symptoms after the birth of her second child, nine months before this illness. It would seem quite likely that this may also have been a pyelitis, and it is known that patients who have a pyelitis during pregnancy not infrequently have a recurrence with subsequent pregnancies. It might also lead one to think that in addition to the pyelitis there might actually have been some pyelonephritis, but I do not believe that this had led to any serious impairment of kidney function. We should like to know more about the exact cause of death of her first child—what the nature of the meningitis was. If this had been tuberculous it would be of considerable importance in the differential diagnosis of the patient's illness.

Physical examination tells us that we have a patient who was probably suffering from some acute infection involving her lung, and the finding of an area of increased voice sounds on the right side leads one to believe that there was a small area of consolidation there. Pelvic examination confirms the diagnosis of pregnancy.

A finding of 5 to 10 white cells in the urinary sediment in a female patient is not of significance unless the specimen was obtained by catheter. It is perhaps of note that the specific gravity was only 1.010, unless the patient had been forcing fluids one would expect that with the high fever and profuse sweating the urine would be quite concentrated. The red-cell count indicating a slight anemia and the leukocytosis with the predomi-

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of the infection is that on one occasion hemolytic streptococci were cultured from the sputum. There is nothing in the story inconsistent with a severe streptococcal infection and subsequent septicemia.

Is it possible to reconstruct the events in the course of this patient's illness? If we follow what we are given, we will have to assume that her original urinary symptoms represent the onset of the illness which eventually caused her death or that the urinary infection was entirely unassociated. I believe it is perfectly possible that the infection may have begun in her kidneys. I believe she developed an extensive bronchopneumonic process probably due to the streptococcus, and it is very characteristic of these lesions to break down rapidly and cavitate. This type of pulmonary lesion is hemorrhagic in nature, similar to those that are described as having occurred during the influenza epidemic of 1918.

We still have to explain the cause and the nature of her neurologic symptoms. As mentioned above, I believe there can be no doubt this patient actually had infection in her meninges. It is possible that the blood which was found in the spinal fluid was related to the original lesion, perhaps due to thrombosis of a vessel with subsequent hemorrhage, but one cannot be sure of this. The blood was more likely due to trauma incident to performing the lumbar puncture. I believe that the patient had a definite meningitis caused by the same organism which was responsible for her pneumonia, presumably a streptococcus, and this in itself would have been enough to explain all the neurologic findings. The other possibility is that the patient, having developed abscesses in her lung, had a metastatic lesion in her brain secondary to this. This lesion would have to be located in the region of the left motor cortex, as all of her neurologic signs were on the right side. The sudden onset of these symptoms is perhaps somewhat in favor of an embolic lesion which later went on to true abscess formation, in other words, a septic embolus. If the patient had a septicemia, metastatic lesions of course might have developed anywhere. There is one other possibility which should be thought of as having produced metastatic lesions. If this patient did have a septicemia, she may also have had an acute endocarditis, perhaps even with acute vegetations containing organisms. If this was so, again, metastatic lesions could have developed anywhere. But we have no evidence that the patient did have septic endocarditis, and she certainly did not have clinical evidence of emboli elsewhere.

Although we have very little to go on, it is interesting to speculate as to whether this patient

had a renal lesion of any severity. We have only one urine examination, and I have already spoken of the discrepancy in the specific gravity. If this was confirmed by subsequent examination,—that is, if the specific gravity remained consistently low, showing inability of the kidney to concentrate,—we might suspect this patient did have some degree of pyelonephritis secondary to this and the previous attack of urinary infection, both associated with pregnancy. In patients who have repeated urinary infections, we not infrequently find congenital anomalies of the urinary tract. It is possible, of course, that these may be present, but we have no evidence of them. I do not believe tuberculosis has to be seriously considered in differential diagnosis even though there are some hints in this direction in the past and family histories. The x-ray findings are not at all those of tuberculosis, and as stated above, I believe tubercle bacilli would certainly have been found if the pulmonary infection were due to this cause. We also have nothing to make us believe that this patient was suffering from miliary tuberculosis. The one other possibility is that the lesion at the right hilus might have represented tumor. If this was so, it is quite within reason that, if the lesion was located in a bronchus, secondary obstruction and subsequent abscess formation might have taken place. I do not believe that we have enough evidence to consider tumor as more than a very remote possibility. Finally, the patient may have had some uterine infection following her abortion.

I believe then that this patient was suffering from a severe streptococcal infection with a streptococcal pneumonia and secondary abscess formation, that she probably had a blood-stream infection with a metastatic lesion in her brain in the region of the left motor cortex, with secondary meningitis, and there may have been some endometritis. I believe that some degree of pyelonephritis may have been found at the postmortem examination.

CLINICAL DIAGNOSES

Lung abscess, postpneumonic
Brain abscess
Meningitis?
Miscarriage

DR LUDWIG'S DIAGNOSES

Abortion
Streptococcal pneumonia with abscess formation
Streptococcal septicemia
Cerebral abscess
Streptococcal meningitis
Endometritis?
Pyelonephritis?

nance of polymorphonuclears in the smear are consistent with infection. I believe that the absence of tubercle bacilli in the sputum on repeated examinations almost certainly rules out tuberculosis as a cause of her pulmonary symptoms. The blood chloride value of 87 cc N/10 sodium chloride tells us that the patient's chlorides were depleted, probably due to chloride loss from excessive sweating. I do not know whether one can lay too much significance on the finding of hemolytic streptococci in the culture of the sputum, as these are very frequently found, even in the throats of normal individuals.

According to the radiologist, the x-ray findings of the area of consolidation around the right hilus and also clouding of the whole right lower and middle lobe are indicative of infection in the lung. The findings do not suggest infarct, as this lesion is usually found in the periphery. Tumor is a possibility, but the radial markings extending out into the lung field from the hilus shadow are not those typically seen in cases of malignancy.

Subsequently, the patient became progressively worse, with an increase of temperature and respirations, cyanosis, and the appearance of a new symptom, namely an attack of disorientation and convulsive movements limited to one side of the body and at first only to one arm. This episode was apparently associated with a marked increase in temperature to 106°F, and from that time on the temperature took on an irregular or septic type of swing. We then note evidence of meningeal irritation with headache and stiffness of the neck. At this point the patient's pregnancy was spontaneously terminated, as evidenced by the passage of blood and clots by the vagina. If the dates are correct, one would not expect a placenta to have developed, and I should say that the statement that an intact placenta was passed should have read "an intact ovum was passed." The occurrence of abortion under these circumstances is not at all unusual, in fact in pneumonia associated with pregnancy the usual course is abortion during the course of the infection. The patient then had another cerebral attack, with her head turning to the right and with convulsive movements of the right arm. The localizing symptoms we have had in connection with her neurologic lesion have all pointed to the left motor cortex. At this time we again note stiffness of the neck and also weakness of the right arm. Lumbar puncture, while its results are somewhat unsatisfactory, is of considerable help in establishing the nature of the lesion. The initial pressure was within normal limits, and respiratory and pulse oscillations were normal. So far as the findings in the spinal fluid are concerned, one cannot be certain whether the red cells present were

secondary to the tap or whether they actually came as the result of the cerebral lesion. If we calculate the number of white cells that would be expected with 25,000 red cells, according to the method described by Solomon, allowing 1 white cell for every 700 red cells, we obtain 300 white cells, and subtracting this from 2100, we still have some 1800 white cells to account for. Again, the protein of 198 mg as compared with a normal of from 15 to 45 mg is markedly increased. We can account for the amount of protein which would have been added to the spinal fluid by the presence of blood serum by allowing 1 mg increase in the protein for every 750 red cells. This, however, gives an increase of only 33 mg, so that we still have 150 mg to account for on another basis. The normal value of the sugar in the spinal fluid is around 60 mg, and here it is decreased by almost half. The differential count of the white cells shows a predominance of polymorphonuclears, and this along with the increased protein and the low sugar are, to me, very definite evidence of bacterial infection within the meninges. We then note that her vaginal discharge increased in amount and became foul smelling. This may indicate imperfect involution of the uterus, or even the onset of uterine infection. A red-cell count at this time showed that the patient had developed a somewhat more marked degree of anemia than was present at entrance. This might have been secondary either to her rather severe infection, to bleeding following the abortion, or to both.

An x-ray at this time showed a definite area of cavitation in the shadow at the right hilus region noted before, and at this time the neurological examination showed more definite signs localizing a lesion in the region of the left motor cortex. We then find a note that the patient was started on prontosil, I suppose because it was suspected she was suffering from a severe streptococcal infection. Apparently her chlorides had been depleted, as a second determination showed a normal value of 98 cc of N/10 sodium chloride. The carbon-dioxide combining power, however, was definitely decreased, indicating some acidosis. This may have been secondary to her infection but it has also been described following the administration of prontosil. The neurological findings increased, with the development of an external strabismus on the right and a paralyzed right leg.

There is little doubt in my mind that this patient was suffering from some very severe infection. From the nature of her temperature chart I should strongly suspect, even though the blood cultures were negative at various times during her stay in the hospital, that she had a blood stream infection. The only clue we have as to the nature

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COMMUNICATIONS should be addressed to the NEW ENGLAND JOURNAL OF MEDICINE, 8 Fenway Boston Mass.

LAWS FOR PURE FOOD, DRUGS, AND COSMETICS

THE inadequacy of the existing Federal Food and Drugs Act is strikingly demonstrated by the fact that seizures of the toxic Elixir Sulfanilamide (Massengill) could be made only on the charge that the word "elixir" implied an alcoholic solution, whereas this product was a diethylene-glycol solution. Astonishing as it may seem, had the product been properly labeled a "solution," not an "elixir," no charge of violation of the law could have been brought against the company that had sold a product which, when used as directed, had caused many deaths.

This example should be shocking enough to arouse the medical profession to action on the pure food and drugs act now before Congress.

The United States Department of Agriculture in its recent report on "Deaths due to Elixir Sulfanilamide, Massengill" makes certain recommendations for legislation to protect the public from drugs which are dangerous because of their inherent toxicity. The recommendations are

1 License control of new drugs to insure that they will not be generally distributed until experimental and clinical tests have shown them to be safe for use. The definition of what constitutes a new drug should include (a) substances which have not been used sufficiently as drugs to become generally recognized as safe, (b) combinations of well known drug substances where such combinations have not become generally recognized as safe, and (c) well known drug substances and drug combinations bearing label directions for higher dosage or more frequent dosage for longer duration of use than has become generally recognized as safe.

Exemption should be made for new drugs distributed to competent investigators for experimental work. A board of experts should be provided which will advise the Secretary of Agriculture on the safety of new drugs.

It is the department's view that no other form of control will effectively safeguard the public from the dangers of premature distribution of new drugs. To increase the penalties for violations and to require label disclosure of ingredients would be helpful, but by no means fully adequate.

In the interest of safety, society has required that physicians be licensed to practice the healing art. Pharmacists are licensed to compound and dispense drugs. Electricians, plumbers, and steam engineers pursue their respective trades under license. But there is no such control to prevent incompetent drug manufacturers from marketing any kind of lethal potion. It should be remembered that Doctor Massengill and his chemist Watkins are far better equipped from the standpoint of technical training than many other persons now engaged in the manufacture of drugs.

2 Prohibition of drugs which are dangerous to health when administered in accordance with the manufacturer's directions for use. This would provide a more appropriate basis of action than that on which proceedings were instituted against the elixir. A number of dangerous drugs are now on the market against which not even a trivial charge of violation can be made.

3 Requirement that drug labels bear appropriate directions for use and warnings against probable misuse. Much injury results from insufficient directions and from lack of warning against overdosage, or administration to children, or use in disease conditions where the drug is dangerous, or possibility of drug addiction.

4 Prohibition of secret remedies by requiring that labels disclose fully the composition of drugs. Many foreign countries now impose this requirement. Many

ANATOMIC DIAGNOSES

Bronchopneumonia, with abscess formation
Cerebral abscesses, multiple
Meningitis
Septic infarction of the spleen and liver
Postpartum uterus

PATHOLOGICAL DISCUSSION

DR TRACY B MALLORY The autopsy on the whole sustained Dr Ludwig's clinical diagnoses and also showed in addition a very interesting and rare lesion which was not foreshadowed in any of the clinical signs or symptoms

We found an abscess of the lung which was located in the apical portion of the right lower lobe. The lung for some distance around the abscess was consolidated, and both the location of the lesion and its appearance favor the assumption of secondary abscess formation in a pneumonic area rather than the commoner type of abscess which followed inhalation of septic material. There was an extensive terminal bronchopneumonia scattered throughout all the remaining lobes.

The central nervous system showed not only a meningitis but abscess formation. The rather indefinite localizing signs of abscess, however, are probably to be explained by the fact that three separate abscesses were present, one of which involved the left motor area, whereas the other two were in the posterior left parietal region and in the wall of the posterior tip of the right lateral ventricle. This last abscess had broken into the ventricle and there is very little doubt that this accident initiated the meningitis. The meningeal exudate was not in the least hemorrhagic, so that the blood which was obtained on lumbar puncture must have been due to trauma.

The genital organs showed a slightly enlarged uterus with a shaggy scar of the placental attachment measuring 2 cm in diameter. There was no evidence of severe infection. The left ovary contained a corpus luteum of pregnancy.

We could find nothing in the kidneys to indicate a pyelonephritis, but the mucous membrane of the pelves and also that of the ureters and bladder were stained a deep red by the sulfanilamide which had been given.

From the pathological point of view the most interesting feature of the autopsy was the liver. Both on the external and the cut surfaces it showed a remarkable mottling of light brown and purple areas. The purple areas varied from the size of a single lobule up to several centimeters in diameter. Within these areas the divisions of the portal vein contained thrombi, some of which were attached to the intima, whereas others lay quite loose within the veins and had all the characteristics of emboli. Although portal thrombosis is by no means rare, clear evidence of gross embolism within the portal circulation is entirely new in my experience. Moreover, infarction of the liver, which is what the purple discoloration turned out to be due to, is also extremely uncommon because of the liver's double blood supply from both the portal vein and the hepatic artery. The usual source of portal thrombosis is infection in the gastrointestinal tract. That was not the case here, however, and it proved possible to find the source of the emboli. Two septic infarcts were present in the spleen, and a branch of the splenic vein immediately adjacent to one of these infarcts contained a thrombus. I think there can be little question that this thrombus at one time extended farther along the splenic vein and that fragments detached from it were responsible for the infarction in the liver.

From the bacteriological point of view the autopsy findings were rather equivocal. The autopsy was done twenty hours post mortem. The heart's blood, surprisingly enough, was sterile. Cultures from the lung abscess, the various brain abscesses and the spleen showed multiple organisms, including *Bacillus coli*, staphylococci, and non hemolytic and alpha-hemolytic streptococci. No beta-hemolytic streptococci were recovered.

OBITUARY

EDWARD AUSTIN ANDREWS

1871-1937

EDWARD AUSTIN ANDREWS was born in Wetmore, Kansas, April 7, 1871

In 1896 he was graduated from the Harvard Medical School, and spent the following five years on the staff of the Children's Hospital before coming to Newton where he practiced his profession for over thirty-five years

During this time he served for twenty-three years on the medical staff of the Newton Hospital, retiring one year ago because of age limit. He played a prominent part in drawing up rules for the safe handling of milk in the City of Newton. These rules were copied by other communities and later led to the general pasteurization of milk.

In addition to his medical duties, he gave generously of his time for the benefit of the city. For fourteen years, he was president of the Newton Centre Improvement Association and was influential in obtaining the Newton Centre library building, various playgrounds and the bathing facilities at Crystal Lake.

Doctor Andrews served the Newton Hospital well. The younger members of the profession will miss him because he was always ready and willing to give them advice, we older members shall miss him because of our many associations with him in one cause or another.

H. W. THAYER,
HENRY W. GODFREY,
DEWITT G. WILCOX,
Resolutions Committee
Newton Hospital Staff

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS
AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 54 BLEEDING AT SEVENTH
MONTH—CENTRALLY IMPLANTED
PLACENTA PREVIA

Mrs F. K., a thirty-seven-year-old gravida VII, was admitted to the hospital on October 3, 1937, in the seventh month of gestation, complaining of painless vaginal bleeding of two days' duration.

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

The family history was negative for malignancy, diabetes, pulmonary tuberculosis and chronic nephritis. The patient had never had a serious illness and had never been operated upon. Menstruation began at fourteen years of age with a twenty-eight-day cycle. Her last menstrual period began on March 7. One pregnancy resulted in a premature stillbirth, there were two early miscarriages and three normal-term pregnancies.

Within a week after the first missed period the patient began to spot daily. This slight bloody show continued off and on until admission to the hospital, there were two moderately severe hemorrhages which were treated by rest and sedatives at the patient's home and a third hemorrhage which began two days before admission.

On admission to the hospital the patient was bleeding very little. Examination showed moderate pallor of the conjunctivae, lips and finger tips. The pulse was weak, and the rate 110 per minute. The pupils reacted to light and accommodation, and all extraocular movements were normal. There was no nasal obstruction. The teeth were in good repair and oral hygiene was excellent. The thyroid was slightly enlarged. The heart was not enlarged, there were no murmurs. The lungs were clear and resonant, there were no rales. The fundus was two fingerbreadths above the umbilicus, and the fetal heart was heard in the midline. All reflexes were normal, and there were no varicosities of the extremities.

A blood count showed 2,700,000 erythrocytes and a hemoglobin of 62 per cent (Sahlb). The urine was acid, with a specific gravity of 1.012 and no albumin or sugar, the microscopic examination showed squamous epithelium and detritus.

Complete rest in bed and careful observation were instituted. A slight blood loss occurred on several occasions during the next five days. On October 8 under perfect asepsis, digital and specular examinations were performed. The cervix was normal in appearance, not taken up, not patulous, and contained no polyp or erosion from which the bleeding might have come. Bimanual examination revealed a feeling of fullness between the cervix and the presenting part. A presumptive diagnosis of central placenta previa was made, and the patient was returned to bed. The following day she was given 500 cc of citrated blood. About five minutes after the completion of the transfusion a reaction occurred characterized by dyspnea, substernal oppression and a rapid thready pulse. The administration of 1/6 gr of morphine and 0.5 cc. of adrenalin (1:1000) afforded considerable relief, and ten minutes later her condition improved and the above symptoms gradually subsided.

It seemed unwise to delay operation, although it was appreciated that the baby, because of prema-

drugs manufactured in the United States are exported to such countries under labels bearing such disclosure. The same drugs are sold to our citizens under labels that give no hint of their composition.

The physician, and the consumer who acts as physician to himself, both have a right to know what they administer.

The foregoing recommendations are limited to provisions which the department believes should be enacted to safeguard the public from the dangers of drugs of one type. That type includes the inherently toxic drugs, such as the elixir,¹ dinitrophenol and cinchophen. Many additional points should be considered if adequate protection is to be extended against even more widespread dangers to health and other abuses of public welfare arising from the inadequate control authorized by the present law over various other types of drugs.

The inclusion of these recommendations in the pure food and drugs act that is now being considered by Congress should be insisted upon by the medical profession. Moreover, to strengthen this law the profession should urge that the regulation and enforcement of this act be under the control of the Food and Drug Administration of the Department of Agriculture. Division of responsibility between the Food and Drug Administration and the Federal Trade Commission is disadvantageous, but is now being advocated by those interests that wish to weaken the act.

A letter from Dr. Henry Christian published in this issue of the *Journal* tells how physicians can meet their obligation in this matter. Unless they do so, the public may well feel that the profession's support of legislation which prohibits the sale of just such drugs as sulfanilamide, dinitrophenol and cinchophen except by prescription of a physician is based on self-interest rather than on concern for the public's well-being.

THE LICENSING OF HOSPITALS

THE report of the Special Commission to Study and Investigate Public Health Laws and Policies, authorized by the Massachusetts Legislature of 1935, and continued by the 1936 session, was made public December 2, 1936, and acted on by the Legislature in 1937.

The commission submitted the draft of a bill¹ which, if enacted, would provide for the licensing of all hospitals in Massachusetts by the Depart-

ment of Public Health, except mental disease hospitals and those operated by the United States Government and the Commonwealth. The proposed bill also provides that local boards of health "shall have first certified to the Department of Public Health that the hospital applying for such license is approved as to location and equipment." The bill would confer on the department authority to make rules and regulations governing the operation of hospitals and would permit local health and police departments to visit and inspect the licensed hospital. Under existing law, maternity hospitals and obstetrical wards in general hospitals are licensed by the Department of Public Welfare, the proposed bill should provide that this function be transferred to the Department of Public Health, for otherwise complications might arise. The House passed the bill submitted with a few amendments, but it was rejected by the Senate in the last day of the session.

The advisability of an act requiring the licensing of hospitals seems reasonable, for although certain organizations publish lists of approved hospitals, there is no authority compelling observance of good administrative methods for the general or private hospitals in Massachusetts. The public should have the assurance of at least average quality of hospital service. Other institutions where medical care is provided, such as nursing homes and accommodations for the aged, should also be included in this licensing scheme.

The bill of last year was sponsored by the Massachusetts Hospital Association and approved by many physicians, and it is expected that a similar bill will be drawn and submitted to the Legislature of 1938.

The arguments in favor of the enactment of a suitable law providing for the licensing of hospitals, which appear in the report² of the commission, are logical and should be read by all who are interested in safeguarding the interests of the several classes of inmates of the institutions to which reference has been made.

REFERENCES

- 1 Report of the Special Commission to Study and Investigate Public Health Laws and Policies. P. 389. Commonwealth of Massachusetts 1936.
- 2 *Ibid.* p. 210.

RECENT DEATH

SMITH—CHARLES MORTON SMITH, M.D., died at his home, 437 Marlboro Street, Boston, January 8. He was in his seventy second year.

Born in Dublin, New Hampshire, he was educated in the public schools there, attended Harvard College and was graduated from Harvard Medical School in 1893. He served an internship at the Boston City Hospital and returned to Harvard Medical School in 1895 to do post graduate work.

Dr. Smith, one of the country's foremost authorities on syphilis, was professor emeritus of syphilology at the Harvard Medical School. An expert on genital syphilis, he served at the Boston Dispensary under Dr. Abner Post, American pioneer in syphilis research and treatment. Dr. Smith had been chief of the syphilis clinic of the Massachusetts General Hospital for fifteen years.

Among his affiliations were memberships in the American Dermatological Association, the New England Dermatological Society, the American Board of Dermatology and Syphilology, the Harvard Club of Boston, and the Roxbury Clinical Record Club, of which he was president at the time of his death. He was a fellow of the Massachusetts Medical Society and of the American Medical Association.

He leaves his widow, the former Mary L. Moulton, a son, Morton Smith, of Wellesley Hills, a daughter, Mrs. William D. Van Alstyne, of Princeton, N. J., and a sister, Mrs. F. Cora Graves, of Westboro.

REPORT OF MEETING

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held on November 23 at the Peter Bent Brigham Hospital, Dr. James P. O'Hare presiding.

The first case was presented by Dr. Clark. The patient was a 52-year-old Jewish, married male. For over 20 years he had shown some bacteria and occasionally had shown a small amount of albumin in his urine. Eleven years before entry he had first shown pus cells in his urine and at this time the diagnosis of bilateral hydronephrosis and hydroureter was made by pyelography and cystography. There was a marked cystitis and a marked bilateral infection of the upper urinary tract. Since that time he had been followed in the Outpatient Department. The infection had persisted but had not been marked until one year before entry, when there was a severe exacerbation with urinary frequency, urgency, dysuria, costovertebral pain, chills and fever. During the last year he had been treated with mandelic acid, frequently with ureteral irrigation, and more recently with protargin. In spite of this prolonged infection, the only significant signs of renal failure were a persistently low specific gravity and a large urinary output. There had been no enlargement of the heart, and the blood pressure had remained normal. He had had coronal ulcers and a persistent dermatitis which were attributed to the presence of chronic infection.

Dr. Quinby commented on the extreme difficulty of treating these cases. He stated that the course was invariably downhill. He also noted that loss of power of concentration of the urine was often the first indication of renal failure.

The second case was presented from the medical service by Dr. McClure. The patient was a 41-year-old female. Six years before entry she was found to have bilateral renal stones. She developed a left perinephric abscess

which was drained on the surgical service. In spite of this drainage there were severe exacerbations of pain, and chills, and 4 months later a left nephrectomy had been done. Removal of the renal stone on the right was not attempted because of poor renal function. One year after this she was found to have hypertension and elevated blood urea nitrogen. Pus was found regularly in the urine. Two years before her final admission she developed angina pectoris and this had increased in severity. Her symptoms of uremia and of secondary anemia increased, she lapsed into coma and died.

The pathological findings in the two kidneys were compared by Dr. Ayer. The kidney removed in 1932 weighed 120 gm., that at autopsy 60 gm. Both showed a marked pyelonephritis. In addition, the kidney removed at autopsy showed marked vascular lesions, which were not present in the specimen removed in 1932.

Dr. Soma Weiss presented the paper of the evening. He first reviewed Bright's classification of nephritis and then called attention to the lack of emphasis which, until recent years, had been placed on the group originating as bacterial infection of the kidney. The attention of himself and of Dr. Frederick Parker, Jr., had first been called to this group by the finding that certain cases which had been diagnosed as essential hypertension could be explained as the end results of pyelonephritis. He then drew certain generalizations. Pyelitis as such probably does not exist. The infection, whether it be hematogenous, ascending or spread by way of the lymphatics, very soon becomes distributed throughout the pelvis and throughout the adjacent renal tissue so that the root of origin cannot be determined by pathological examination. Furthermore, the presence of the infection in the interstitial tissue and in the lymphatics enables kidneys which show no clinical evidence of infection still to be the seat of an active infectious or inflammatory process. These changes were illustrated by lantern slides. In a similar way he went on to show how kidneys which are the seat of chronic infection gradually become scarred and shrunken. This latter process can advance after the infection has disappeared. In addition to actual destruction of the glomeruli there frequently is considerable tubular destruction by blockage from below. Furthermore, vascular changes are superimposed. The presence and the extent of these changes seem to depend on how the patient reacted to his renal damage by an arterial hypertension. The changes in the arterioles themselves are usually of the hyperplastic arteriosclerotic type. They are also analogous to those changes found in the pulmonary arteries of cases of mitral stenosis in which there has been a severe degree of pulmonary hypertension and circulatory stasis. Thus the vascular changes are dependent upon the hypertension but not entirely so, for inflammation in the kidney itself apparently has a direct effect upon the arterioles. This is best illustrated by cases of unilateral pyelonephritis. In these the arteriolar changes are definitely more marked in the affected kidney than in the normal kidney. Areas in the same kidney where the inflammation is more pronounced also show less arteriolar change than less inflamed areas in the same kidney. Just as in essential hypertension, the so-called benign and malignant types of arteriolar change are found. Their presence apparently depends on the height and rate of progression of the hypertension. Pyelonephritis is responsible for about 15 or 20 per cent of the instances of the malignant phase of hypertension. Dr. Weiss called attention to the frequency of pyelonephritis and pointed out the importance of an understanding of this condition in the fields of surgery, pediatrics, obstetrics and internal medicine. Because of the close rela-

turity, might not survive after delivery. Because of these factors, a low vertical cesarian section was performed on October 11. The placenta was centrally implanted, covering the entire os. A female child weighing 3 lb. was delivered and lived only a few hours. The patient's convalescence was normal.

On the seventh postpartum day a blood count showed 3,250,000 erythrocytes with a hemoglobin of 68 per cent (Sahli) and 7000 leukocytes with a normal differential. The patient was discharged on October 27, the sixteenth postpartum day, in good condition.

Comment. The delivery of this patient, when the chance of a viable child was questionable and in the absence of bleeding, is open to criticism. Had this patient been kept in bed in the hospital in the hope that no bleeding would occur until the baby's chance of survival was assured, it is quite likely that a viable baby would have been obtained. It is true that, at any minute, brisk hemorrhage might have necessitated operation. Under those circumstances, the operation would have been undertaken for the sake of the mother because of active bleeding, irrespective of the result on the child. The danger to her from a recurrent severe hemorrhage, occurring while she was in the hospital where delivery could be consummated within an hour, was negligible, and if a period of two weeks could have elapsed before another hemorrhage, the baby probably would have lived. There is a difference of opinion about performing a low cervical cesarian section in cases with placenta previa. Some feel that in placenta previa, because of the possibility of increased hemorrhage, there is a contraindication to low section. At any rate, an abdominal section for placenta previa on a patient who is bleeding and not in labor, after the point of viability of the fetus, is becoming generally accepted as the more conservative method of treatment.

MISCELLANY

DEATH OF DR. LAWRASON BROWN

In the death of Dr. Lawrason Brown at Saranac Lake, New York, on December 26, the profession has lost one of its foremost tuberculosis specialists. He had been actively connected with the Trudeau Sanatorium for nearly forty years, and was particularly prominent in the development of the Trudeau School of Tuberculosis, in which many physicians have received unexcelled instruction in the diagnosis and treatment of tuberculosis. He was a pioneer worker in intestinal tuberculosis and was among the first to adopt roentgenologic findings as a means of classifying pulmonary lesions.

He had been an associate editor of the *American Review of Tuberculosis* for many years. He was a member of the

American Association of Physicians and a past president of the American Climatological Association, the National Tuberculosis Association and the American Sanatorium Association.

CORRESPONDENCE

FOOD, DRUG AND COSMETIC CONTROL

To the Editor. Physicians in New England have an opportunity to give valuable help in securing better laws on pure food, drugs and cosmetics and their advertising. To find out why there is need for betterment read the editorial "When to Lock the Stable" in the December 9 issue of the *New England Journal of Medicine*. The Secretary of Agriculture at Washington says: "Electricians, plumbers and steam engineers pursue their respective trades under license. But there is no such control to prevent incompetent drug manufacturers from marketing any kind of lethal potion." Why?

The *Literary Digest* of December 18, 1937, answers as follows: "Thus it is amazing to note that today tens of thousands of physicians, the country over, are embattled concerning the development of novel government agencies for socializing medicine—before they have moved note worthily toward lifting a natural government function to a wise and effective plan. This 'lift' is tragically needed. Our government drug regulations and their enforcement are still on the plan of moronic farce."

How can we answer this challenge? By writing today, each of us, to our two United States Senators, to our local representative in the House of Representatives at Washington and to Senator Royal S. Copeland and Representative Clarence F. Lea, chairmen of the two committees studying needed legislation. Say in such a letter that you wish better control of food, drugs and cosmetics by a law that provides for labels stating their composition in full with warnings as to dangers in their use, that prevents distribution of drugs and cosmetics before they have been tested as to toxic action and that prevents general distribution to the lay public of drugs which, if used indiscriminately, might be dangerous, all to be enforced by the Food and Drug Administration of the United States Department of Agriculture, and that you wish restriction on all false and misleading advertising of these products by a strong law with penalties to be administered by the Food and Drug Administration so that there will be no divided responsibility.

Do this yourself and do it today. Then when your local medical society meets have it adopt resolutions expressing these ideas and send them to those already mentioned.

A medical profession that does nothing toward better laws for pure food, drugs and cosmetics is assuming responsibility for other deaths likely to occur under present laws. That people have died from using Elixir Sulfanilamide in recent months is a challenge to physicians. Remember that powerful interests in the drug and food trades fight against restrictive laws, they are well organized, so there is great need that every physician express himself to those who make our laws in Washington.

HENRY A. CHRISTIAN, M.D.

Peter Bent Brigham Hospital,
721 Huntington Avenue,
Boston, Mass.

Business

Report of Committee Investigating Minimum Fees to Be Charged for Services to Welfare Recipients. It is hoped that all interested in this work will attend.
Incidental business.

Communication

The Management of Uterine Prolapse. Dr Louis E. Phaneuf.

Collation.

FRANK S. CRUICKSHANK, M.D., *Secretary*

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Peter Bent Brigham Hospital, on Monday, January 24, at 8 15 p. m.

PROGRAM

The Development of Fatal Luetic Aortitis within Two Years After Primary Infection. Dr Maurice A. Schnitzer

Errors in the Direct Method of Measuring Venous Pressure. Dr Richard H. Lyons.

Physiological Effects of Artificial Fever. Dr John A. Gibson, 2nd.

The Incompatibility of Hypertension and Active Tuberculosis. Dr A. W. Contratto

The Prognosis of Potential Rheumatic Heart Disease and Rheumatic Mitral Insufficiency. Drs. John A. Boone and Samuel A. Levine.

The Precordial Lead. Drs. Roger S. Robinson and A. W. Contratto

Interested physicians and medical students are invited to attend.

JAMES M. FAULKNER, M.D., *Secretary*

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

The next meeting of the Boston Society of Psychiatry and Neurology will be held at the Boston Medical Library, on Thursday evening, January 20, at 8 15

PROGRAM

Annual election of officers. Reports of secretary and treasurer

Human Credulity as Illustrated by Witchcraft. Dr Theodore Diller, of Pittsburgh, Pennsylvania.

H. HOUSTON MERRITT, M.D., *Secretary*

BOSTON SOCIETY OF ANESTHETISTS

The next meeting of the Boston Society of Anesthetists will be held on Tuesday, January 25, at the Hotel Kenmore.

PROGRAM

Dinner 6 30 p. m.

Business meeting. Election of officers 7 40 p. m.

Scientific meeting 8 15 p. m. Dr Soma Weiss will speak on 'Preanesthetic and Postanesthetic Problems from the Point of View of the Internist.'

Physicians and medical students are cordially invited to attend.

ELEANOR B. FERGUSON, M.D., *Secretary*

THE MASSACHUSETTS SOCIETY FOR SOCIAL HYGIENE

The Massachusetts Society for Social Hygiene is sponsoring an open meeting at Ford Hall, 15 Ashburton Place, Boston, Thursday evening, January 20, at 8 15

Dr Stanley H. Osborn, commissioner of health of the State of Connecticut, will speak on 'The Connecticut Blood Test Before Marriage Law,' and will describe its genesis, its provisions and the way in which it has so far worked out.

Dr Nels A. Nelson, director of the Division of Genito-infectious Diseases of the Massachusetts Department of Public Health, will discuss Dr Osborn's paper. Dr Nelson is opposed to such legislation and the meeting will thus give an opportunity for those who attend to hear both sides of this important question. There will be opportunity also for open discussion from the floor.

This meeting will be of particular interest to physicians, legislators, social workers and other professional workers. The meeting is open to the public and a cordial invitation is extended to all who are interested. There will be no admission fee.

TUFTS MEDICAL ALUMNI CLUB OF WORCESTER COUNTY

There will be a meeting of the Tufts Medical Alumni Club of Worcester County at the Bancroft Hotel, Worcester, on Wednesday, January 19. Dinner at 6.30 p. m. will be followed by a business meeting at 7.30 p. m.

Dr Henry W. Hudson, Jr., will speak on 'Conceptions and Misconceptions of Surgery in Infancy and Childhood.'

C. BYRNE, M.D., *President*,
N. S. SCARCELLO, M.D., *Secretary*

LECTURES AT THE FAULKNER HOSPITAL

A series of illustrated, public, health lectures at the Faulkner Hospital will be held in the hospital auditorium at 4 p. m. on Sundays. The schedule is as follows:

January 16—Heart Ailments and Their Prevention. Dr Burton E. Hamilton.

January 23—Common Colds and Their Prevention. Dr James A. Halsted.

January 30—Skin Evidences of General Ill Health. Dr E. Lawrence Oliver.

February 6—Practical Hints for the Expectant Mother (women only). Dr D. J. Bristol, Jr.

February 13—Stomach and Duodenal Ulcer. Dr Edward S. Emery, Jr.

February 20—Progress in Dental Surgery. Dr Kurt H. Thoma.

February 27—Backache. Dr John D. Adams.

March 6—Chest Operations in the Treatment of Tuberculosis. Dr Harlan F. Newton.

March 13—Diets and Vitamins in the Preservation of Health. Dr Maurice B. Strauss.

March 20—Diseases of the Prostate Gland (men only). Dr Franklin Balch, Jr.

March 27—Hay Fever and Asthma. Dr Walter S. Burrage.

April 3—Nerves and Their Relation to Insanity. Dr Merrill Moore.

April 10—Common Foot Ailments and Their Significance. Dr Lloyd T. Brown.

April 24—Syphilis: Its cause, prevalence and eradication. Dr Channing Frothingham.

tion of pyelonephritis to arterial hypertension of renal origin and to the small contracted kidney, pyelonephritis should be considered as one type of Bright's disease. The close interrelation between the various types of Bright's disease was emphasized.

Dr Christian in discussing the paper made a plea for a more simplified classification of Bright's disease. He advocated a division into (1) acute stage, (2) subacute or chronic stages with edema, and (3) a chronic stage with out edema. This last stage, as characterized by small shrunken kidneys, can be reached either by essential hypertension with vascular change, by glomerular damage, by infection, or even by primary tubular damage as in nephrosis.

NOTICES

REMOVAL

DAVID KUNIAN, M.D., announces the removal of his office to 19 Nahant Street, Lynn.

CAMBRIDGE HOSPITAL

The regular monthly meeting of the staff of the Cambridge Hospital will be held in conjunction with the Middlesex South District Medical Society in the lecture hall of the nurses' home at 10 00 a. m., January 19.

A clinicopathological discussion will be held. A buffet luncheon will be served at 1 00 p. m.

Please notify the director if you plan to attend.

JOSEPH M. WADDEN, M.D., *Secretary*

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen, discussed, and when indicated, treated with radium and high-voltage x-ray.

Physicians are welcome to visit this clinic and to bring a patient to the clinic for diagnosis.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, January 25, at 8 15 p. m.

PROGRAM

Presentation of cases

Medical Investigations in Peru in 1937. Drs. Richard P. Strong, Henry Pinkerton, and David Weinman.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary*

JOINT MEETING OF THE SUFFOLK DISTRICT MEDICAL SOCIETY AND THE BOSTON MEDICAL LIBRARY

There will be a joint meeting of the Suffolk District Medical Society and the Boston Medical Library at the Boston Medical Library, 8 Fenway, on Wednesday, January 19, at 8 15 p. m.

The "Principles and Proposals" will be discussed by the following: Dr. Robert B. Osgood, Dr. Frank H. Lahey,

Dr. Channing Frothingham, Dr. Elliott P. Joslin, Dr. Richard M. Smith and Dr. Roger I. Lee.

JOHN P. MONKS, M.D., *Secretary*
Suffolk District Medical Society

JAMES M. FAULKNER, M.D., *Secretary*,
Boston Medical Library

CARNEY HOSPITAL

The monthly clinical meeting and luncheon of the Carney Hospital Staff will be held on Monday, January 17, in the Andrew Carney Assembly Hall, at 11 30 a. m.

PROGRAM

Case reports

Epidural Cyst with Removal and Recovery
Polycythemia

Carcinoma of Cervix Treated with Radium. Subsequent Removal of Rapidly Growing Ovarian Tumors.

Pathological exhibit.

Determination of Blood Loss in Certain Standard Operations for Malignancy. Dr. Weston Buddington. Discussion by Drs. A. Fraser, William C. Moloney and Roy J. Heffernan.

Physicians and students are cordially invited to attend.

ROY J. HEFFERNAN, M.D., *Secretary*

GREEN LIGHTS TO HEALTH

The following change in the "Green Lights to Health" broadcast, being given over Station WAAB at 7 30 p. m., on Wednesdays, has been announced. Dr. Elliott S. Robinson will speak on January 19. His subject will be "The Laboratory Fights Pneumonia."

BOSTON MEDICAL HISTORY CLUB

There will be a meeting of the Boston Medical History Club at the Boston Medical Library, 8 Fenway, on Monday, January 17, at 8 15 p. m.

Dr. Donald S. King will talk on "The Development of Our Knowledge of the Lung and Its Diseases."

BENJAMIN SPECTOR, M.D., *Secretary*

NEW ENGLAND SOCIETY OF PHYSICAL MEDICINE

The regular meeting of the New England Society of Physical Medicine will be held at the Hotel Kenmore, on Wednesday evening, January 19, at 8 00.

PROGRAM

Some Fundamental Types of Physical Medicine and Their Practical Application. Dr. Franklin P. Lowry. Demonstrated by Miss Esther Klein. Discussion—Dr. Howard Moore.

The council will meet at 6 00, dinner will be served in the Empire Room at 6 30.

All members of the medical profession are cordially invited to attend.

WILLIAM D. MCFEE, M.D., *Secretary*

THE NORFOLK DISTRICT MEDICAL SOCIETY

The regular meeting of the Norfolk District Medical Society will be held in the Hotel Kenmore, on January 25, at 8 15 p. m. Tel. Ken 2770.

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BRONCHIECTASIS

Physical and Psychologic Manifestations

EDWARD D. CHURCHILL, M.D.*

BOSTON

WHEN the operative mortality of lobectomy for bronchiectasis was at least 50 per cent and the results in many survivors uncertain or imperfect, a cautious attitude in advising the operation was understandable. At the present time, however, we are privileged to report a mortality rate of 47 per cent in a series of 84 cases with lobectomies for bronchiectasis. This includes all cases in which the operation has been done or attempted. What is even more encouraging, only 1 death has occurred in the 66 unilateral lobectomies performed in the past four years, giving an operative mortality of 1.5 per cent. This death occurred as the result of Type III pneumococcus pneumonia and pericarditis ten months after operation, in a patient who had been discharged from the hospital. As a residual empyema cavity was still present and may have been a contributing factor, the death is recorded as an operative mortality. In 6 cases of bilateral disease a lobectomy has also been carried out on the second side. There has been 1 death among these 6 cases, attributable to bronchiectasis in the remaining upper lobes.

All the patients who have survived have been greatly helped by the operation, and about 85 per cent have been entirely cured. The operation causes no noteworthy deformity. With rare exceptions, operative incisions and bronchial fistulas heal within a few weeks. There is only one persistent bronchial fistula in our entire series—the first patient operated upon by a method now abandoned. These statistics give an entirely new status to the operation of lobectomy, and stand as a challenge to the physician who refers to surgery in bronchiectasis as a last resort. The indications for recommending lobectomy must be redefined on the basis of a careful evaluation of the symptoms of the disease.

Only a close acquaintance with a number of patients in all stages of the disease, not only before but after the operation, gives a conception of the profound effect bronchiectasis may exert upon the life of an individual. It is not necessary to dwell upon the suffering produced by gross forms of the disease. Patients with profuse foul sputum have long been referred to as social outcasts. The effects of the so-called "milder" forms of bronchiectasis must be evaluated now that it is practical to extend the indications for operation. Members of the medical profession are apt to call bronchiectasis mild if the patient appears to be in a state of good nutrition, and if the sputum is not offensive enough to drive other patients from the waiting-room.

Bronchiectasis, severe or mild, is a disease of youth and early adult life, and exerts its influence on both body and mind during the formative period—an age in which social contacts are established, personality is crystallized and foundations for life's work are laid. Handicaps and physical limitations, which a mature individual might integrate or compensate for, produce an intense effect during these important years.

A productive cough is usually the presenting symptom. It may in itself cause distress and inconvenience to the patient, and almost invariably renders him sensitive to its effect upon others. He is reluctant to appear at social gatherings or to attend the theater. Even a trip in the subway may prove disastrous unless a patient can calculate when his next "emptying time" is due. A spell of coughing is apt to be induced by laughter, alarming other people and causing the patient acute embarrassment. The result in a sensitive individual is a tendency to shun social contacts. Invitations are refused. The sufferer becomes increasingly shy and solitary. Parents and the immediate family may be sympathetic and tolerant, but others are oftentimes cruel and ruthless. Casual friends and classmates, having no insight into the state of af-

From the Thoracic Clinic and Surgical Services of the Massachusetts General Hospital, Boston.

Read before the Eastern Sanatorium Association, October 30, 1936.

John Homan, Professor of Surgery, Harvard University; chief of the West Surgical Service, Massachusetts General Hospital.

NEW ENGLAND PATHOLOGICAL SOCIETY

There will be a meeting of the New England Pathological Society in the large amphitheater of the Children's Hospital on Thursday, January 20 at 8 00 p m

Dr C P Rhoads, Rockefeller Hospital, New York, will speak on 'The Pathologic Morphology and Physiology of Refractory Anemia'

Physicians and medical students are cordially invited to attend

J B HAZARD M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JANUARY 17

MONDAY JANUARY 17

- *11 30 a m Carney Hospital clinical meeting Andrew Carney Assembly Hall.
- 8 15 p m Boston Medical History Club Boston Medical Library 8 Fenway

TUESDAY JANUARY 18

- 9 10 a m Boston Dispensary Types of Hemolytic Anemia Dr William Dameshek
- *10 a m 12 30 p m Tumor clinic Boston Dispensary
- *12 m South End Medical Club Headquarters of the Boston Tuberculosis Association 554 Columbus Avenue, Boston

WEDNESDAY JANUARY 19

- *9 10 a m Boston Dispensary Clinicopathological conference Dr R. C. Wadsworth Dr Robert W. Buck.
- *12 m Clinicopathological conference Children's Hospital Amphitheater
- *8 p m New England Society of Physical Medicine Hotel Kenmore Boston

THURSDAY JANUARY 20

- 8 30 9 30 a m Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Children's Hospital
- *9 10 a m Boston Dispensary Recent Advances in the Treatment of Pulmonary Tuberculosis Dr M H Holden
- *8 p m New England Pathological Society Amphitheater of Children's Hospital
- 8 15 p m Boston Society of Psychiatry and Neurology Boston Medical Library 8 Fenway
- 8 15 p m Massachusetts Society for Social Hygiene Ford Hall 15 Ashburton Place Boston

FRIDAY JANUARY 21

- 9 10 a m Boston Dispensary Here and There in Endocrinology Dr Pulcr Albright
- *10 a m 12 30 p m Tumor clinic Boston Dispensary
- 12 m Clinical meeting of the Children's Medical Service Massachusetts General Hospital Ether Dome

SATURDAY JANUARY 22

- 9 10 a m Boston Dispensary Hospital Case Presentation Dr Samuel H. Proger
- 10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A. Christian

SUNDAY JANUARY 23

- 4 p m Free public lecture Harvard Medical School amphitheater of Building D Teeth Deciduous Permanent and Artificial Dr Paul E. Boyle
- 4 p m Free public lecture Beth Israel Hospital Boston in conjunction with the Women's Auxiliary What to Do About Cancer Dr Harry P. Friedman
- 4 p m Illustrated public health lecture, Faulkner Hospital Common Colds and Their Prevention Dr James A. Halsted

Open to the medical profession

- JANUARY 14—Tumor Clinic Boston Dispensary Page 94
- JANUARY 16 APRIL 24—Illustrated public health lectures Faulkner Hospital Page 95
- JANUARY 17—Carney Hospital Clinical meeting Page 94
- JANUARY 17—Boston Medical History Club Page 94
- JANUARY 18—South End Medical Club Page 51 issue of January 6
- JANUARY 19—Tufts Medical Alumni Club of Worcester County Page 95
- JANUARY 19—Cambridge Hospital regular monthly staff meeting Page 94
- JANUARY 19—New England Society of Physical Medicine. Page 94
- JANUARY 20—Boston Society of Psychiatry and Neurology Page 95
- JANUARY 20—Massachusetts Society for Social Hygiene. Page 95
- JANUARY 20—New England Pathological Society Notice above.

- JANUARY 24—New England Heart Association Page 95
- JANUARY 25—Harvard Medical Society Page 94
- JANUARY 25—Boston Society of Anesthetists Page 95
- FEBRUARY 1—Greater Boston Medical Society Auditorium of the Beth Israel Hospital Boston 8 30 p m
- FEBRUARY 2—Second National Social Hygiene Day Page 49 issue of January 6
- FEBRUARY 10—Pentucket Association of Physicians Hotel Bartlett 95 Main Street Haverhill 8 30 p m
- FEBRUARY 14—American Board of Internal Medicine Page 909 issue of December 9
- MARCH 10 11 12—New England Hospital Association. Page 51 issue of January 6
- APRIL 4 8—The American College of Physicians Page 41 issue of July 1
- MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston
- OCTOBER 17 21—Clinical Congress of the American College of Surgeons, New York City

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p m. New Bedford.

ESSEX SOUTH

- FEBRUARY 2—Council Meeting Boston
- FEBRUARY 9—Essex Sanatorium Middleton Clinic at 5 p m. Dinner at 7 p m Speaker: Dr John B. Hawes 2d. Subject: Dust and Disease.
- MARCH 2—Lynn Hospital Clinic at 5 p m. Dinner at 7 p m. Speaker and subject to be announced
- APRIL 6—Gloucester Hospital Gloucester Clinic at 5 p m. Dinner at 7 p m. Speaker and subject to be announced.
- MAY 5—Censors meet at Salem Hospital 3:30 p m.
- MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p m. Speaker and subject to be announced

FRANKLIN

Meetings will be held at the Franklin County Hospital Greenfield at 11 a m the second Tuesdays of March and May

HAMPDEN

Meetings will be held on the fourth Tuesday in January April and July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club Stoneham at 12 15 p m. on March 16 and May 11

MIDDLESEX NORTH

Meetings will be held at the Vesper Country Club Lowell on January 26 and April 27

MIDDLESEX SOUTH

JANUARY 19—Page 1113 issue of December 30

NORFOLK DISTRICT

- JANUARY 25—Page 94
- FEBRUARY 23—Hotel Kenmore 8 15 p m Dermatitis Venenata Due to Cosmetics and Industrial Irritants. Dr John G. Downing Discussion by Dr Francis P. McCarthy
- MARCH 29—Hotel Kenmore 8 15 p m Subject to be announced but to be related to diseases of the kidney Dr Albert A. Horner
- MAY—Annual meeting
- The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

- Meetings held at 12 noon
- FEBRUARY 3—Norfolk County Hospital South Braintree
- MARCH 3—Norfolk County Hospital South Braintree.
- APRIL 7—At the Quincy City Hospital
- MAY 5—Annual Meeting

PLYMOUTH

Meetings will be held at 11 a m on January 20 March 17 April 21 May 19 and July 21

SUFFOLK

- JANUARY 19—Joint meeting with Boston Medical Library Page 94
- MARCH 15—Joint meeting with Boston Obstetrical Society

WORCESTER

- At the following meetings, except the annual meeting dinner will be at 6 15 to be followed by business session and scientific program
- FEBRUARY 9—Worcester State Hospital Worcester
- MARCH 9—Memorial Hospital Worcester
- APRIL 13—Hahnemann Hospital Worcester
- MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced.

It may appear that I have drawn too harsh a picture of what is called mild bronchiectasis. It is true that many patients are able to make an admirable adjustment to the disease. The description has been compiled, however, directly from case histories. Members of the lower mental strata naturally offer fewer psychologic problems or are inarticulate concerning them. Nearly every patient will discuss these aspects of the disease more freely after the operation has been completed. This is because a closer relation with the surgeon has been established during the emotional crisis of the operation, and because when freed of the disease the patient's struggle with it comes to the surface.

In determining indications for operation in the given case, the physician must have insight into these subtler aspects of the malady. It is impossible to measure the severity of bronchiectasis by the number of cubic centimeters of sputum in the cup or by the foulness of the breath. The mere fact that a patient is able to work or attend school is not a safe criterion of his happiness. The effect of the disease on the personality of the patient and on his life as a whole must be taken into consideration.

It is particularly important that bronchiectasis be recognized and adequately treated early in life, in this way serious psychologic difficulties and personality changes may be avoided. Patients between the ages of five and twelve stand the operation admirably. Young adults should be operated on before they assume the social responsibilities of marriage, or before the door to a happy marriage is closed to them by their illness.

The following case records are typical of the stories that can be obtained from patients with bronchiectasis. They express better than any description the actual nature of the disease.

CASE REPORTS

Case 1 I. E., a 25-year-old woman, had extensive bilateral disease dating from pneumonia in childhood. A great deal of her schoolwork was done at home, causing her to miss the social life of her schoolmates. She completed her college education, but devoted all her limited energy to actual study. While taking vocational courses she was frequently told, "Your work is excellent, but your health is so poor we cannot recommend you for a position." She continually felt that she was "obnoxious to people, despite the fact that the sputum was foul only at intervals. Because of this, she disliked having a roommate. On several occasions older girls at college took her to task for the cough, telling her that if you tried harder you would cough less."

She was examined yearly for tuberculosis, and in the middle of her second college year was sent home because she was "in the last stages of tuberculosis." An experience that almost proved to be a catastrophe happened in her last college year. She fainted in a classroom, and while she was unconscious a large amount of sputum poured out on the floor. Her embarrassment would have caused her

to leave school if she had not been within two months of completion of the course.

A very intelligent mother trained in educational and social work has been able to handle the problems of adjustment in an admirable way. The girl was never held back, but urged to enter sports and other activities up to the limit of her endurance. A close circle of family friends provided an enjoyable social background. The most difficult period of adjustment was between the years of 14 and 18.

Although emotionally well adjusted to her handicap she presented herself at the age of 25, realizing that her symptoms were steadily becoming worse. Employment in the fields in which she had struggled for an education was closed to her. Thoughts of marriage had long been thrust out of her mind. When the dangers and discomforts of a bilateral lobectomy were outlined they were accepted cheerfully and without fear. The courage and philosophy gained through years of suffering have carried her through successfully.

Case 2 K. B., a 5-year-old boy cannot be expected to have insight regarding his disease or even to give a coherent account of symptoms. The objective signs of the disease were minimal. Fortunately a very intelligent mother realized that the child's activities were limited by the disease and a lobectomy was performed. Four months after the operation, when the boy had gained 12 lb in weight and showed a corresponding gain in strength, Mrs. B. commented as follows: "My neighbors did not understand how I could give my consent to such a dangerous operation because they thought K. was perfectly well and could run and play like the other boys, but I knew he was not well, and the great change after the operation certainly proves it."

Case 3 H. S., at the age of 23, is a confirmed hypochondriac. His father is a well-to-do manufacturer who has done everything possible for the boy's welfare. The disease began in childhood. Three years were spent in the Southwest. Cough and sputum were never excessive, but constant fatigue and its resulting lack of ambition colored his personality. He was desperately afraid of tuberculosis. It took this young man considerable time to summon courage to face the operation. The influence that turned the tide was a chat with a cured patient.

Fortunately the convalescence was smooth and uneventful. Even so, the patient imagined every possible complication. It is doubtful whether he will completely overcome his neurotic tendencies, even though the organic basis has been removed. A lobectomy early in life might well have prevented the development of this abnormal personality.

Case 4 The experience of A. L., a 28-year-old man, proves the value of our admonition that bronchiectasis should receive adequate treatment before marriage or other social responsibilities are undertaken. He suffered very little from his bronchiectasis during his bachelor days. He completed his education and held a good position as sales manager in a large company. On return from work he would lie down for an hour's rest before dinner. Three evenings a week were spent in a gymnasium. He was an expert tennis player.

He married an attractive girl whose home was in a distant city. Taking up her home in a strange place, she naturally leaned heavily upon him for entertainment. He began to make long automobile trips in order to get home for dinner. The pair would frequently go to bridge parties or to the theater in the evening. Although the

fairs, are critical, and are prone to suggest that the cough is an annoying habit which the patient could control if he tried to do so

Bronchiectasis is characterized by acute pneumonic episodes initiated by respiratory infections, particularly during the winter months. The acute infections interrupt progress in school or cause loss of time from work.

In the intervals between acute attacks, the smoldering infection in the lung or the retention of pus in the dilated bronchi may give rise to a sense of fatigue that is insidious and vicious in its effects. When this has persisted for years a patient may accept it as a normal state of affairs, and may become aware of his limitations only when relieved by cure. On the other hand, he may be totally unable to work, or if he can work, the routine of the day absorbs all available energy so that he has little ambition to undertake other activities. One patient remarked that she was always glad to get home from school just to rest. Many are unable to keep up with their schoolwork.

The lack of physical endurance paralyzes plans and ambitions for a future career. Over and over again patients confess that they had wanted to take up certain vocational training, but realized that they lacked the physical energy to see it through.

The confusion with pulmonary tuberculosis because of the cough, sputum and hemorrhages raises important psychologic conflicts. When a person develops pulmonary tuberculosis he usually faces the facts, and after a more or less stormy period of adjustment develops a philosophy concerning his disease. I do not wish to imply that the psychologic problems of tuberculosis are simple ones, but they can be faced as a more clean-cut problem. In many respects it is better to have tuberculosis outright than to be constantly suspected of having it. The external world is more understanding and sympathetic if a definite label can be affixed to a complaint. Tuberculous patients find companionship in the fraternity of this disease. Nearly all my patients with bronchiectasis have been fearful of or sensitive about tuberculosis. One girl was sent home from college in the middle of her second year because she was "in the last stages of consumption." Many others have been unable to hold steady employment because fellow employees became alarmed about their cough. One patient sought out-of-door employment on a milk route, with the result that complaints came from customers who feared that he had tuberculosis.

Hemorrhages are frequent occurrences in bronchiectasis, and are always very disturbing to the patient. Again, a patient with tuberculosis accepts a hemorrhage as a natural event in the course of

his disease. He knows of other patients who have had similar occurrences, and is not unduly alarmed. The hemorrhages in bronchiectasis instill the terror of the unknown. They may be so frequent and so severe as to incapacitate the patient over long periods of time. Sanatorium care is often prescribed for hemorrhage mistakenly diagnosed as evidence of tuberculosis.

The menstrual cycle is frequently disturbed by the chronic invalidism of the disease. Scanty and irregular flow with delayed adolescence appears to reflect the general state of ill-health. In a patient with bilateral bronchiectasis, regular and normal menstruation was established for the first time in her life at the age of twenty-seven after bilateral lobectomy. Menstruation prior to this time had occurred only at irregular intervals of several months.

Young women with bronchiectasis usually consider themselves unfit to bear children. This impression may be obtained directly from their medical adviser, or may find origin in the remarks of friends and relatives.

Patients with basal bronchiectasis find that the exertion and posture of sexual intercourse provoke coughing and expectoration. If the sputum is foul the results may be peculiarly embarrassing.

If the symptoms of bronchiectasis are at all severe, the patient early becomes aware of the impossibility of getting married. This rarely presents itself as an acute psychologic problem, as the limited social contacts lead to this conclusion insidiously but inevitably. Patients are rarely willing to admit that this is a problem, but when the doors both to marriage and to a career of choice are closed, the future appears to hold little promise for any young person.

Young adult patients rarely hesitate to elect a chance of cure if the possibility is offered. In spite of the mortality statistics already referred to, the operation of lobectomy has always been presented to the patient as a serious affair. In the few instances in which operation has been refused, the negative reaction has been due to prejudice, low-grade mentality or pressure from outside sources. Unfortunately, we still see the patient who returns to his family doctor for advice and is told that the operation is an impossible one and that to consent to it means certain death. Having in mind certain extensive operations that have been necessary in neglected cases of chronic empyema, the uninformed doctor pictures the horrible deformities that result from thoracic surgery.

As a matter of fact, there is rarely any deformity whatsoever following lobectomy. If desired, the operation can be performed through an intercostal incision without even the removal of one rib.

At the university clinic I was told that I had asthma, owing to the fact that I was allergic to many different foods, plants, and so forth. For 1 of the 2 years there I was put through a desensitization process, which was very tedious and brought no good results.

When I returned to the state hospital, — this time in the social service department, — I was very glad to tell people at last what it was that ailed me. Until this time I had thought that no one in the world had ever had a condition like mine. But the remedy seemed worse than the disease, so I did nothing about serums or cutting out all the foods that I was told to. Even a slight attack of asthma was enough to depress me, and send me almost into a panic. It would make me feel as though I were going to be a semi-invalid all my life, and the future looked very black. As soon as the attack was over I lost this fear.

I began to read about asthma having an emotional basis, and had plenty of encouragement to think along this line from various psychiatrists I knew. For a year I had analytic therapy, which did not, however, change my physical condition, unless possibly indirectly by helping me to become somewhat more mature emotionally.

During the 5 years after I had left the West I did not consult any doctor (except that I always saw our family physician at various times and frequently had physiotherapy and other general treatment from him). I really felt that the doctors would have nothing to offer. I still thought that somehow my troubles might all be on a psychologic basis. I knew I was unhappy because of my restricted social life, my failure to marry, and so on. I wanted children, yet it seemed as though I had no right to have them. I had been told, too, that with my cough I should probably be unable to carry a child. All this meant that I should have to remain a social worker, and I wasn't even sure I could manage that. I should be expected to go on to more responsible, demanding positions. Even now I have to go to many meetings where the old problem comes up. Last year, after a series of meetings, one social worker spoke to me about it, and said I certainly sounded as though I were in the last stages of tuberculosis.

Early last summer I was coughing unusually hard and had some pain in my chest. I felt that I could not go on any longer, and was ready to give up my work and go to Arizona or its vicinity. Someone persuaded me to consult a specialist first.

N B. There are various reasons why my social life has been restricted. Many things are too strenuous for me even to attempt. The fact that I require more rest than most people made it necessary for me to cut down somewhere, and I couldn't do so in my work. Unless you are always ready to do things, people get out of the habit of including you. At the theater and the symphony coughing disturbs other people.

Case 6. M. J., a 42-year-old man, displayed quite a different reaction to the disease. His cough dated from early childhood. At the age of 14 or thereabouts he chanced on some correspondence concerning his illness, between his mother and a patent medicine company. He learned that he had tuberculosis and Bright's disease. Shortly thereafter he overheard the family doctor assuring his mother that he would 'be dead at 17, whatever was done for him. His response was the fatalistic 'what the hell' attitude. As his illness was going to get him and he was doomed to die anyway, he decided to enjoy life while he could.

He took up the life of a wanderer and hobo. In a lumber

camp in the Rocky Mountains he cut a trap door by the head of his bed for convenience in expectoration. On the prairies of northwestern Canada he was made to sleep in a separate shack because fellow workmen feared tuberculosis. During the World War he tried desperately to suppress his cough while on a night scouting expedition in no man's land. Unable to keep from coughing, he was sprayed by machine gun fire and barely escaped with his life.

He finally ceased his wandering when he found the disease was not incompatible with life, and married. He now works steadily as a plasterer, but during the past 2 years he has noticed a steady increase in shortness of breath and a lack of endurance.

By adopting a casual and 'hard-boiled' attitude toward the disease, he altered the course of his whole life, but protected himself from the embarrassment caused by specific symptoms. His cough and expectoration have not kept him from social contacts or marriage. Looking backward, he regrets that he did not settle down to a good trade which was open to him at 18.

This attitude is frequently encountered in young boys, but is rarely projected into adult life as in this patient, the fact that his sputum was not foul enabled him to play his role with success. A similar attitude is well expressed by the patient in Case 5, who spit for the other children and told them it was 'poison'. It usually collapses with adolescence, when contacts with the opposite sex become desirable.

Case 7. L. D., a young man, aged 17 years, had steady employment in a butcher shop in a small New England town, he found that the copious and very offensive sputum coming from a bilateral basal bronchiectasis absolutely prevented him from forming friendship with girls. He came to Boston ready to accept any risk to be freed of his disease. A bilateral lobectomy has left him with no cough and no sputum.

CONCLUSIONS

Experience in the study and treatment of bronchiectasis has led me to two conclusions. First, established bronchiectasis is not a self-limited disease but a persistent and often progressive malady, constituting even in its milder forms a serious physical and psychologic handicap to the patient and eventually terminating in death. Secondly, while postural drainage, bronchoscopic drainage, change of climate, operations on nasal sinuses, phrenic-nerve paralysis, artificial pneumothorax, thoracoplasty, x-ray treatment, lipiodol instillations, injection of arsenicals, vaccine therapy and a host of other so-called remedies may in certain instances bring gratifying symptomatic relief there is no real cure but extirpation of the diseased segment of lung.

Fortunately, the time has arrived when the medical profession can stop fumbling with bronchiectasis and approach its treatment by a direct, effective and safe form of therapy. A physician shoulders a grave responsibility when his advice withholds the benefits of surgery from a young patient suffering from this disease. Operation can no longer be termed a measure of last resort.

man had always considered himself physically fit for any thing, the pace began to tell, and the disease flared up with an attack of pleurisy. He began to feel tired, and wanted to stay home and rest in the evening. Rather than face the situation frankly with his wife he assumed a defensive attitude, becoming irritable and uncommunicative. When he became affectionate he would suddenly turn away to conceal a cough, and would find his action misinterpreted. He tried to conceal his illness from his wife and her family, feeling that he would be blamed for having married in the knowledge that he had had his disease for years. As a child, he concealed his cough by saying that he was sick to his stomach, now he concealed his cough from his wife by turning on the faucets in the bathroom.

Matters went from bad to worse, within 10 months of the marriage the wife was in tears and returned to her home, and the patient was anxiously seeking a cure for his disease at any risk. A careful study of the situation made it probable that the disease was the primary element and the marital difficulties secondary, so that lobectomy was undertaken. The patient's defensive attitude was carried through the operation and into convalescence, he tried to conceal the fact that he was undergoing a serious operation for a condition that was present before his marriage. After his complete recovery the whole situation was talked over with both him and his wife. They are now trying to make a new start in their married life.

Case 5 A. P., a 32 year-old woman, wrote the following account, entitled *How Bronchiectasis Has Affected My Life*.

My cough I have had with me daily since I was 4 years old. I don't know just what it meant to me when I first had it. I remember my mother's hovering over me at night, bundling me up in the winter, and even in the summer telling me to stay in the sun, I knew my playmates did not have to do this. I also remember a group of teachers in the primary school calling me over and asking me about it, I think I was pleased with the attention but did not know what to say. I used to spit for the other children and tell them it was poison.

A few years later I began to get irritable with my mother. Every time I turned around there was a spoonful of cough medicine waiting for me. I openly rebelled against it all and could not be trusted to take the medicine. It may have been this situation that led my mother to suspect me of being deliberately careless about rubbers, gloves, buttoning my coat, and so forth. All this was a bone of contention between us. My mother commented frequently on the change in my disposition, and there grew up a legend about my former good naturedness.

I now know from stories my mother has told me, and from my own experience as an adult, that her life was considerably upset by friends and relatives. Half of them took my cough very seriously and may have been critical of her for it, and the other half said it was nothing and were disgusted with the attention she paid me. When I had attacks of bronchitis or pleurisy, she always cried and thought I was going to die, but I can't recall that I had any such fear.

"During this period (roughly from 9 to 12) I grew to be annoyed with anyone else who drew my attention to it. The whole thing was a nuisance to me. I was advised by an aunt never to laugh because it would aggravate the cough, and many people told me they couldn't tell the difference between my laugh and my cough. My music teacher used to compare my cough with one she had had before she went to Canada for treatment for tuberculosis. I had great respect for her, but I was somewhat indignant

that such a comparison should be made. When someone would say, 'You have a cold all the time! I would reply crossly, 'It isn't a cold!' But I couldn't tell them what it was, and I felt very foolish. All the doctors I had been to had never given a name to it, they had only assured my mother that I would outgrow it.

By the time I went to high school I had developed a sinus infection that certainly completed the picture of a cold all the time. I had plenty of girl friends who were used to me as I was and accepted me, so that I had a happy enough time with them, but I did not go on to the new things—organized sports and friendships with boys. I had grown very self-conscious and was afraid of comments. When any were made, I passed over them as quickly as I could, no longer insisting that I did not have a cold. The classes were 50 minutes long with 10 minutes between, and this used to help me, because in the interval I could go off by myself and cough all I wanted to. Long meetings in the assembly hall were a problem, however, and I sometimes begged off, but I couldn't do it often because the instructors began questioning me. While I was still in high school I went to another city as a delegate to a conference. At one of the meetings, which was long, I became quite choked up and began to cough a good deal. I tried to stifle it and apparently the result was funny, because it made a group of girls laugh, and afterward the leader asked me what those queer sounds were that I had made. This particular experience was unusually humiliating. My family did not object when I stopped going to church after one of the members of the congregation loudly announced that she would like to put a long brush down my throat to scrape it out.

At college the girls soon pointed out to me that I was a spoiled child and that I had no poise. They also called me a sissy because I had so little endurance when we went mountain-climbing, or even just hiking. But nothing much was said about my cough, for which I was duly grateful, and before the 4 years were over I could go to chapel and classes and be fairly relaxed. I did little in the way of extracurricular activities, and studied only enough to keep a B average, for my health was my first care. I took no medicine, but I was scarcely ever sick. The only time I went to the infirmary, I did so voluntarily to get a rest. There was another girl in the dormitory with a cold. During the night every time I coughed the nurse came in and gave her some medicine. In the morning she resentfully told the doctor about it. They decided to keep me until the cough was better. I had to tell my story, and they scratched their heads but let me go. Then there was a puzzled gym teacher who stood beside me during a vital-capacity test, insisting, 'But you certainly can do better!' until she gave up in disgust. But on the whole college wasn't so bad.

"After graduation I went immediately to a state hospital as a psychometrist. I was 20 years old but was still lacking in poise, and this was especially apparent in my contacts with men, which began at this time. One told me I had an inferiority complex. Someone from the hospital told my family that when I first arrived it had been thought I must be homesick because I seemed so depressed. These remarks did not trouble me, but made me begin to notice my reactions and moods. The hospital staff took a personal interest in my difficulties, and 2 years later offered to do some sinus operations, which helped me a good deal. After doing mental testing for 4 years I went to the Mid West and studied social work. One day I noticed that it was hard to breathe, and that it was fatiguing to move about. This feeling came in spells and was frightening

however, obviated this difficulty. On April 15, eighteen days after operation, the plaster cast was removed. X-ray examination of the chest in the lateral position showed that the sternum descended in a vertical direction. The posterior border of the sternum was 8.4 cm from the anterior border of the thoracic spine, as compared with 3.5 cm in the preoperative film.

This patient was discharged from the hospital May 24, two months after operation. His breathing was no longer restricted, cardiac action was free and digestion was normal. Nevertheless, we realized that it was too early to determine the ultimate result. Subsequent events indicated the importance of a conservative point of view in evaluating the results of this operation.

A search of the literature on funnel chest revealed very few operative cases. When only two or three costal cartilages were severed, symptoms ceased for a short time only and the end results were not satisfactory. Sauerbruch³ was the first to do extensive resection for this deformity. His first case was reported in 1913. He operated upon a second patient in 1931, but symptoms recurred.

Operative results in 9 congenital cases in children treated surgically were presented at the French Congress of Surgeons, 1934. These cases represented the surgical experience with funnel chest in Europe. The standard procedure was that of Garnier, a T-shaped sternotomy and ample resection of costal cartilages, as required.

In this country, Alexander⁴ of Michigan, in 1931 reported 2 traumatic cases treated by operation. The first patient was a boy sixteen years old, injured four years previously while wrestling. Even after bilateral resection of five costal cartilages the sternum could not be elevated. It was necessary to divide the sternum longitudinally before this structure could be raised. A special apparatus was employed for fixation. A tendency to recurrence disappeared after the patient had been given a course with blow board and an apparatus connected with the hospital traction system.

Alexander's second patient was a woman twenty years old who had been injured two years before in an automobile accident. The body of the sternum was removed from the third to the sixth rib, with resection of the attached costal cartilages. Symptoms were relieved and did not recur.

Carr⁵ reported a case in a young man nineteen years old who was operated upon. Head. He removed the left third, fourth, fifth and seventh costal cartilages, and the right fourth, fifth, sixth and seventh, and resected the lower half of the sternum and the xiphoid process. Carr refers to a second case which ended fatally, gives no

details. When a third case came to his attention, Carr stated that he was reluctant to subject another patient to surgery because of the great risk involved.

Our third case of funnel chest was seen January 6, 1937. The patient, a man thirty-one years old, had a depressed sternum dating from early childhood, but the deformity had given him no discomfort until two years previously. He then complained of sharp pain in the region of the left nipple, occurring about once a week. Epigastric distress, nausea and vomiting occurred at short in-

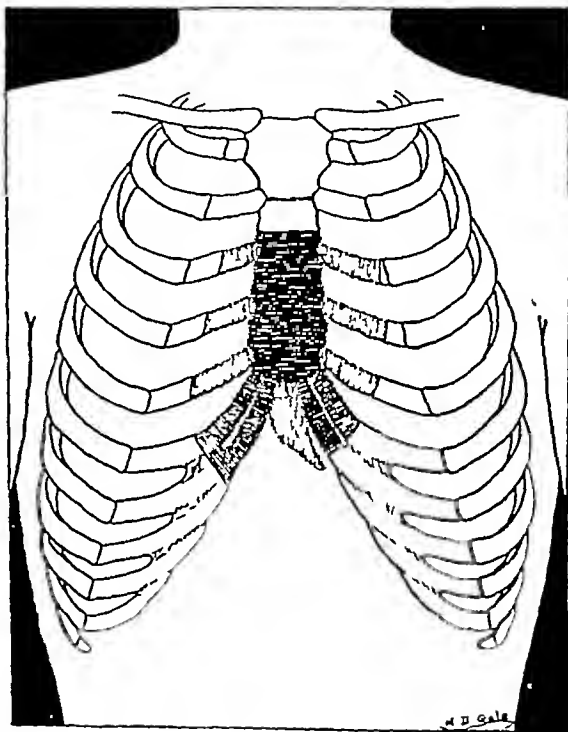


Figure 2.

tervals. Symptoms were more severe after the ingestion of fatty foods and after heavy meals. There was no dyspnea, no palpitation or cough and no noticeable loss of weight, but the man was unable to work.

X-ray examination of the chest two weeks before entry showed that the posterior surface of the lower end of the sternum was 1 cm from the anterior surface of the thoracic spine. The heart was entirely to the left of the midline. A lateral view of the spinal column showed marked scoliosis of the thoracic spine, convex toward the left. The electrocardiographic tracing showed some myocardial damage and sinus tachycardia.

From our experience and that of Alexander, Head, and the French surgeons, we concluded that the only operation which offered hope of perma-

A NEW METHOD OF DEALING WITH FUNNEL CHEST

PHILEMON E. TRUESDALE, MD

FALL RIVER

THE developmental anomaly of funnel chest was first reported by Bauhinus in the sixteenth century, but few cases had appeared in the literature up to 1900. This deformity is fairly common among children admitted to hospital clinics. Treatment, when required, is medical. In adults, however, funnel chest may greatly incapacitate the individual, so that some form of mechanical readjustment of the sternum is necessary in order to obtain permanent relief. Surgical needs for this complaint have been recognized in Paris by Ombrédanne and Garnier,¹ who adopted an operation that was fairly well standardized by 1935. It consisted of a T-shaped sternotomy with resection of the costal cartilages as required, followed by immobilization with a special orthopedic apparatus.

The cause of funnel chest is unknown. Many writers refer to its origin as congenital, while others believe that the condition may be acquired through trauma. Only a few traumatic cases, however, have been reported, because accidents which result in collapse of the sternum usually end fatally.

Our interest in this subject began in April, 1935, when we discovered that a funnel chest was a contributory cause of death following an operation for diaphragmatic hernia in a patient nine years of age. The marked degree of dextrocardia which existed was attributed to a shifting of the mediastinum due to the presence of the herniated hollow viscera. Much to our surprise, however, we found that with repair of the diaphragm and the return of a negative pressure in the left pleural cavity, the heart did not change its position from the extreme right. The patient died on the fourth day after operation. Postmortem examination revealed a permanent midline partition made by the sternum, and the physical impossibility of the heart's shifting to a normal position. The right ventricle showed hypertrophy, which was undoubtedly caused by pulmonary resistance.

Our next patient with this deformity was admitted to the hospital March 11, 1936 (Fig 1). He was eighteen years old, under weight, and appeared sick. For several years he had had dyspnea and "stomach trouble" associated with anorexia, nausea and dysphagia. Three months before admission the symptoms had become so severe that he was forced to give up his work as a clerk. His

weight had dropped from 170 to 140 lb in the last year.

Operation was done March 28 under avertin-ether anesthesia. The procedure has been described in an article² published in 1936. Briefly it consisted of disengaging the body of the sternum by severing the costal cartilages on both sides and dividing the



Figure 1

sternum horizontally at the level of the third intercostal space. Two perforations were then made through the lower third of the sternum about 2 cm apart, and through them a heavy silver wire was passed so as to form a loop for extension. The wire was attached to a windlass suspended from the crossbar of a wooden frame incorporated in a plaster cast fitted to the chest.

With this apparatus we were unable to obtain the desired degree of elevation of the sternum, because tightening the windlass produced a suction which closed the esophagus. Moderate elevation

operation. It seemed imperative, therefore, to evolve a technic which would relieve symptoms permanently, minimize the chances of infection and thus offer a reasonable hope of safety and cure. The method necessary to accomplish this result would entail removal of the sternum and the attached costal cartilages without opening the mediastinum. Since the cause of hemorrhage in the previous case was a suppurative mediastinitis, it was a matter of great importance not to have a repetition of this serious complication. It was therefore decided to attempt a complete subperiosteal excision of the depressed portion of the sternum and costal cartilages. Figure 3a shows the vertical incision over the sternum, and Figure 3b the amount of bony and cartilaginous portions of the thoracic cage which were resected. These structures were carefully severed without entering the mediastinum or pleural cavities. The periosteum and perichondrium were reflected from the body of the sternum and the costal cartilages respectively, and dissected free.

Figure 4 shows the steps in this procedure. (1) The depressed sternum with the attached costal cartilages is seen in situ. (2) The left costal cartilages have been stripped from the perichondrium. The heavy lines indicate the points of resection on sternum, xiphoid and right costal cartilages. (3) The body of the sternum from the third interspace to the xiphoid process and the attached costal cartilages on the right have been disengaged and elevated. (4) The bony and cartilaginous portions of the thoracic cage have been removed, leaving the periosteum and the perichondrium intact.

The dissection was accomplished without hemorrhage from any large vessel. On its completion there was no communication with the mediastinal space, the periosteum and perichondrium forming an improvised roofing for structures in the mediastinum.

The wound healed by first intention, and the patient made a comparatively comfortable recovery. He left the hospital symptom-free and has remained well since that time.

It is fair to assume that this patient is cured. Thus, from our experience with funnel chest, which has been fraught with disappointment and disaster, we have evolved a simple technic for dealing with a disabling deformity. This technic converts an extremely hazardous procedure into an operation which is relatively simple, rational, safe, and when supplemented by exercises, in all probability, curative.

151 Rock Street.

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DISCUSSION

DR. JAMES W. SEVER, Boston. I was very much interested in part of this paper when it appeared last year in the *New England Journal of Medicine*. I have looked up the literature because last year's report recalled a time many years ago when I was a house officer at Dr. Bradford's at the Children's Hospital. I begged him at that time to let me operate on some of the very badly deformed funnel chests that we saw in the Scoliosis Clinic, with the purpose of devising some means of lifting the sternum. At that time I had no idea of what had been done. As a matter of fact, very little had been done. Dr. Bradford was not willing, as he put it, to sacrifice any child to my enthusiasm. So my efforts stopped there.

There has recently been pronounced interest in this matter, and this work of Dr. Truesdale is at least hopeful, although some of it is discouraging. Apparently if anything is done, the best thing is to resect the lower portion of the sternum—not the manubrium.

We see at the Children's Hospital a great many cases of funnel chest. Most of them are mild. The very bad ones have never been improved by any postural treatment that I know of, and surgery is the only hope. If nothing is done, the result is always a high degree of structural scoliosis, tremendous heart displacement and embarrassment of respiration. So far as I can discover from the literature, some of the deaths that occur shortly after this operation are caused by the sudden twisting of the supporting structures of the heart, which have been displaced for a long period of time.

I wish Dr. Truesdale would say something about the question of opening the pleura, which varies greatly in its attachment to the posterior portion of the gladiolus.

We have had no traumatic cases of depression of the sternum so far as I know, and nothing particular is said in Dr. Truesdale's paper about the cause of severely depressed sternums. The only such case I have ever seen, which perhaps some of you may remember, occurred at a Harvard and Princeton football game many years ago. Holden, the captain of the Harvard team, tackled a Princeton man, whose knee hit Holden on the chest. Holden was carried off the field and taken to the Massachusetts General Hospital. He had a bad fracture of the sternum and nobody knew what to do. In a sudden reflex coughing spell he coughed the sternum back into place. Perhaps that is a satisfactory method of treatment.

DR. FREDERIC J. COTTON, Boston. I have been interested in the few cases of funnel chest that I have seen. I remember the Holden case. I was a house officer at the Massachusetts General when he was brought in. His gladiolus was driven in under the manubrium. I did not wait for an accidental cough, but stretched him over the end of the bed, grabbed his arms and had him cough, and the gladiolus went back into place. The report of that case was my first contribution to surgical literature.

Again, my interest in this condition was sharply aroused because my infant daughter had a pronounced funnel chest. One of her uncles also had a funnel chest, which was rather marked but it never incapacitated him. In my child's case the outlook was not very promising. Respiratory exercises, however, effected an absolute cure.

The third case I have in mind is that of an old nurse who came to me last spring on account of her back

nent relief of symptoms was a removal of the sternum. Therefore on January 16, ten days after the patient's admission, we did a subtotal excision of this structure. The thorax was opened by a lapel

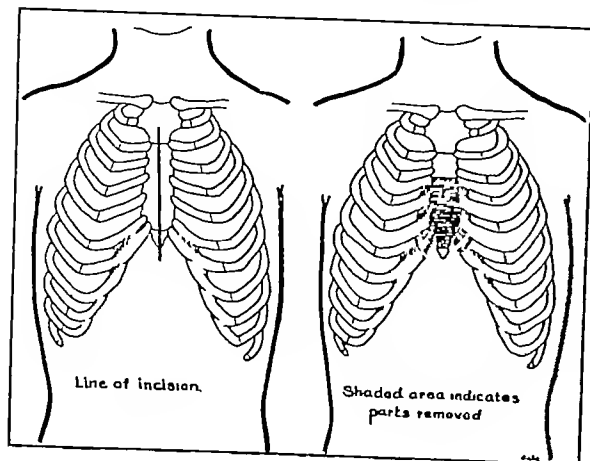


Figure 3a

Figure 3b

incision. The sternum, together with the cartilaginous portions of the third, fourth, fifth, sixth and seventh ribs, was removed (Fig 2). During this procedure a minute opening was made in the

pleura on the right side, this resulted in a pneumothorax. On the third postoperative day x ray examination showed collapse of the right lung and a small amount of fluid at the base. The wound drained a moderate amount of seropurulent fluid. On the twelfth day death resulted from a sudden massive hemorrhage from the wound. Postmortem examination revealed an inflammatory process in the mediastinum with a thin seropurulent exudate. There was also an acute suppurative pericarditis. The source of the hemorrhage was an opening in the superior vena cava.

Two months after this experience the young man who had been operated upon March 28, 1936, returned to the hospital stating that the sternum had again become depressed to the degree present before operation. His symptoms had recurred, and he was again unable to work. He stated that he had received such marked relief after operation that he wanted to submit to another if considered advisable.

The outcome in our third case had been most discouraging. No standard technique had thus far been devised for removal of the sternum, and each case reported had presented many obstacles at

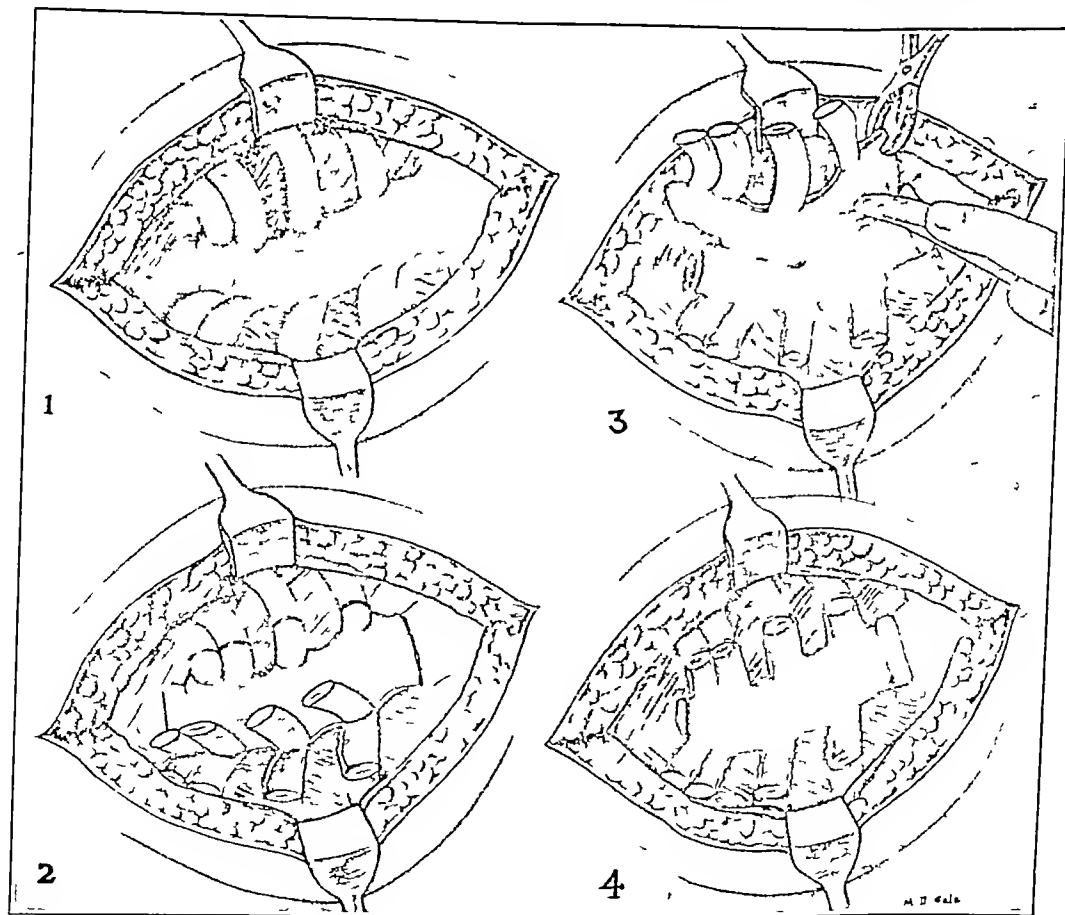


Figure 4

RIGHTS AND LEFTS IN MEDICAL PRACTICE

ROGER I LEE, M.D

BOSTON

PRESIDENT ELIOT was always fond of describing the advances in medicine as prodigious. And while there has been a great lag between the advances in medical science and their application to medical practice, nevertheless these marked advances have, of necessity, resulted in many changes in practice. For centuries, the medical practitioner, despite the buffetings of his social and economic status and despite, too, his variegated relation to scholarship, was a rugged individualist. Clearly Hippocrates conceived him as such and he so emerged at the beginning of the era initiated by the discovery of anesthesia and asepsis.

Your medical practitioner of that day had a purely personal relation with his patient. The hospital was essentially only an asylum for the sick poor. Preventive medicine was unknown. The apprentice method of medical instruction was the common and best method of instruction. Medical schools were largely private ventures. In the Harvard Medical School, for example, the attendance at lectures for two years, attested by punched tickets, sufficed for a degree. The lectures were ordinarily the same lectures repeated yearly. The state, that is, any governmental unit, took little or no interest. As the state began to interest itself in medical practice and established a system of licensure, applicants received a license either by passing an examination or by virtue of years of practice.

A second early step in the communities along the Atlantic seaboard was the evolution of the insane asylum under wretched county control into the mental hospitals under state control. With the consent of most of the interested bodies, the Commonwealth of Massachusetts, for example, began to care for the mentally ill. To be sure, a large factor in this step was the humane and successful treatment of mental invalids at the McLean Hospital, then as now a department of the Massachusetts General Hospital.

Another step was the introduction of the free distribution of vaccine virus in Massachusetts, followed by that of diphtheria antitoxin. The changing argument was interesting. It was successfully argued that if the State adopted compulsory vaccination in the schools, it should furnish the vaccine free. In the case of diphtheria antitoxin, following a tragic attempt in another state to corner for financial gain the available supply of diphtheria

antitoxin, the argument was the right and indeed the obligation of the State to protect its citizens from a communicable disease both by treatment and by prevention.

This argument has been pushed to cover all diseases dangerous to the public health, that is, essentially, the communicable diseases. But it is to be noted that mental disease, already a charge of the State, does not come under that category. And soon we find attempts to bring other diseases, usually chronic, under state control, such as cancer, arthritis, and the like. During this time, changes were being rapidly made in other directions, some involving directly or indirectly medical practice. Communities undertook public water systems and public sewerage systems. To be sure, there are still a few private water systems in Massachusetts as well as elsewhere, but they are very few. Many communities, or combinations of communities, undertook public lighting and power systems. Indeed, at this very moment, there is a titanic struggle between the forces of privately owned and publicly owned so-called public utilities. There we see more clearly the opposing fundamental lines of thought. The advocates and opponents of public ownership of such public utilities as light, power, telephone and railroads find, relatively speaking, a line of cleavage. And yet the mails are government owned and operated, and in England the radio, so far as broadcasting is concerned, is a governmental business.

Without going farther into details, one may pass to the subject of education. It has been accepted that education is an obligation upon the government and we see the natural and inevitable effect of pushing this to the so-called logical conclusion.

Great state universities have sprung up all over this country and with them have come state university medical schools, research departments and hospitals. Such has been the impetus that President Conant was moved to discuss whether the privately endowed university had a place in the modern trend of educational affairs.

There is neither need nor time to discuss the changing trend of the hospital—its change from an asylum for sick poor to an elaborate institution for the treatment of the sick both rich and poor.

In this prodigious progress, the medical practitioner is bewildered. He no longer finds himself a rugged individualist with the old intimate relation of doctor and patient. He finds the much despised boards of health of yesteryear aggressively

symptoms. She had a funnel chest, but it was not extreme. The back symptoms did not amount to much and cleared up, but she still was quite anemic. I suspected that the lack of respiratory capacity had a good deal to do with it, so I started her on exercises. She carried them through, spent a summer out-of-doors, and turned up in my office the other day with a practically normal chest. She lifted the sternum out by exercises, and I think a good deal can be done in that way.

DR. GEORGE M. SABIN, Burlington, Vermont. I should like to ask Dr. Truesdale about the hemorrhage in these cases—the successful cases.

DR. TRUESDALE. There was practically no hemorrhage. By keeping inside the periosteum and perichondrium one escapes the danger of traumatizing the pleura and of cutting the internal mammary artery.

DR. FRANK R. OBER, Boston. There are not so many funnel chests as there were when rickets was a common disease. This condition is known as cobbler's disease. A cobbler frequently developed a funnel chest from his position in repairing shoes and cleaning boots, and yet might live to a ripe old age. The congenital type is relatively common. If you become enthusiastic over this operation of Dr. Truesdale do not do it to the exclusion of all other treatment for funnel chest. At the Children's Hospital we put these patients on hyperextended frames and give them deep-breathing exercises. They respond to such treatment very well. One should employ this method for at least five years and should not wait until the child has arrived at the age when his bones are fixed and solid.

DR. ELLIOTT C. CUTLER, Boston. Considering the physiology of respiration, it appears that removal of the sternum would seriously jeopardize the ability of the lungs to fill adequately. I have observed that following the operation of pericardiectomy, where a part of the sternum and the adjacent ribs on the left side are removed for proper exposure, respiratory efforts reveal a considerable sucking in of the soft parts of the anterior chest wall, with a resultant lowering of the vital capacity. I wish Dr. Truesdale would tell us whether he has made studies of the vital capacity of the boy who survived the procedure he has described.

It seems as though the inspiratory effort would cave in the unsupported soft parts and thereby interfere somewhat with respiration. All those interested in thoracic surgery would, I am sure, welcome information on this point.

My other question relates to the possibility of recurrence of the condition. If this is a congenital anomaly, it may be caused by something which increases respiratory effort, such as a tracheal stenosis or a mild bronchial obstruction. If the condition persists, I should suspect that as the periosteum reformed bone it would still be sucked in by the mechanical difficulty of the primary anomaly, and thus the funnel chest would recur.

What has been said by both Dr. Cotton and Dr. Ober about breathing exercises may well have had a part in the ultimate cure of this boy.

DR. TRUESDALE. I am unable to answer the questions bearing upon the patient's vital capacity before and after removal of the sternum. After operation this young man said that he felt as though a very tight belt encircling his chest had been removed, and that he could climb stairs and do many things that he had been unable to do before. It is possible that when there is some bone formation he may again have a retraction of the chest wall. In the meantime, however, he has been prescribed systematic simple exercises and deep breathing. In this way we hope to keep the region of the sternum on a level with the anterior wall of the thorax.

Dr. Cotton and Dr. Sever mentioned snapping out the sternum after it has been depressed by a sudden injury. If these cases are caused by trauma and if they come to the hospital early enough, you can see from what has been said that the deformity can be corrected readily and without difficulty. It is probably true that the funnel chests which we have seen in adults had their origin in childhood from congenital causes such as rachitis. The funnel chest is slight at first, and the depression seldom becomes so marked that the patient cannot work. When it does, as in the cases reported in this paper, surgical intervention is indicated. The cases with spinal curvatures and the congenital types often develop tuberculosis. Inter-current tuberculosis of the lungs has been reported as a complication in some of the advanced cases, as mentioned by Dr. Sever.

itics makes strange bedfellows, for example the union of the prohibitionists and the bootleggers

But, shall we say that the Rights are those who believe that the advances in medical practice which result in governmental control by the use of public funds are proceeding at too fast a pace? Certainly, as I see it, the pace is terrific. All along the lines there seems to me to be too great wastage. But three most important considerations stand out in my mind. I believe that medical tradition has value. I believe that medicine has just barely become a science, and dread the effect of projecting this new science entirely into the seething furnace of politics. Will the prodigious advances continue then? Lastly, I believe that in many instances of seeming emergency, in which govern-

mental aid is involved, an ardent individual enterprise, determination and aggressiveness will frequently accomplish something that pessimistic inactivity never will. And this applies to private hospitals and privately endowed medical schools.

As you gather, I am decidedly on the Right in this question. Perhaps it is because I am a Fellow of Harvard College, a privately endowed body, or because I am a Trustee of the American Medical Association, or because I served for a number of years on the Massachusetts State Board of Health, or am on the Advisory Committee of the United States Public Health Service. But, consistency is a certain virtue of small minds.

264 Beacon Street.

THE TREATMENT OF THE VOMITING OF EARLY PREGNANCY

DUNCAN E. REID, M.D.,* AND HAROLD M. TEEL, M.D.†

BOSTON

NAUSEA and occasional vomiting of two or three weeks' duration are so common in early pregnancy as to appear almost physiologic in origin. They occur to some degree in approximately half of all pregnancies. Their frequency and duration vary greatly in individuals, as well as in different pregnancies in the same individual. But if the vomiting is of such frequency and persistence that it materially interferes with fluid balance, acid-base equilibrium or other phases of nutrition, it is potentially dangerous and must be regarded as abnormal. When the disturbance is as severe as this, it is commonly referred to as hyperemesis gravidarum, or pernicious vomiting.

The incidence of such abnormal vomiting at the Boston Lying-in Hospital is approximately 1 for each 150 deliveries. More than half these cases, however, have been referred by private physicians or other hospitals for treatment, so that the true incidence is nearer 1 in 400 deliveries. Our remarks will be confined largely to the treatment of the excessive or abnormal vomiting of pregnancy as defined above.

ETIOLOGY

The cause of the disease is unknown. In the recent literature two important trends of thought have been expressed. First, it has been contended that response to a specific form of therapy points to a specific etiologic agent.^{1, 2} Needless to say, most

of the glands of internal secretion, and particularly those intimately associated with reproduction, have been thought to perform their functions either inadequately or too well. As might be expected, many forms of endocrine therapy have been used, and have for the most part been credited with good results. It is fair to state, nevertheless, that these preparations are usually employed in conjunction with other therapeutic measures. Also, many forms of treatment without endocrine preparations are attended with reasonable success except in an occasional patient. Indeed, in the vast majority of cases successful therapy in hyperemesis gravidarum is, it seems, more nearly correlated with the degree of conviction under which it is prescribed than with the specific therapeutic measures involved. Secondly, there has been a trend to the study of the secondary nutritional and metabolic alterations which result from vomiting.^{3, 4, 5} These disturbances are the results of loss of body fluid and sodium chloride, associated with varying degrees of carbohydrate, protein, mineral and vitamin deficiencies. The pathological findings in fatal cases demonstrate the importance of many of these resultant nutritional disturbances. The common lesions at autopsy may be reproduced in starvation experiments.

During the past four years at the Boston Lying-in Hospital, the treatment of vomiting of pregnancy has been directed primarily at the correction of each of these nutritional disturbances which accompany and often aggravate the disease.

It is our belief that indiscriminate use of the term "neurotic vomiting" has been productive of

Read at the combined clinical meeting at the annual meeting of the Massachusetts Medical Society, Boston, June 2, 1937.

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interested in his cases of measles, pneumonia, cancer and arthritis. He finds the hospitals in active financial competition with him. Sometimes, when his altruism impels him to send his patient to a hospital, irrespective of whether or not he takes care of the patient there, the hospital charges, when paid, preclude recompense for the doctor. Not infrequently the patient has a parent or relative, or perhaps a friend, who pays for the hospital room, and another who pays for special nurses, but the doctor must be paid, if at all, by the patient who neglected to budget for illness.

He sees the veterans' hospitals increasing in size and numbers, and he sees each Congress relaxing the restrictions on the use of these hospitals. He is most definitely unhappy about the operation of accident insurance and of the various industrial boards. To increase his confusion all sorts of panaceas are offered him—general health insurance in many forms, co-operatives, group medicine, and the like. To him it seems as if the old traditions of medicine, the rugged individualism of the doctor, and the opportunity of earnest, strenuous effort on the part of any single physician were all cast overboard. He is oppressed by the mass-production note on all sides.

As he thinks, he gropes for some solution. To some of the doctors, the idea of the totalitarian state no longer seems absolutely theoretical and crazy. Does not each year find an increasing number of doctors employed by the town, the county, the state and the federal government? Certainly, there is no indignity attached to a position on the local board of health or to a paid position in the local hospital, in one of the state hospitals, in the State Department of Public Health, in the United States Public Health Service or in one of the government hospitals in the Veterans' Bureau. Certainly many notable figures in medicine are employed in the great state medical schools and hospitals. He knows really that economic pressure is a very vital factor that often furnishes the motive power for changes. And, so, ordinarily, the fundamental and philosophic conception is largely disregarded even as it was largely disregarded by those instrumental in bringing about these changes. The word security, social or financial, has a great psychologic effect.

Inasmuch as this is a selfish world and most motives are selfish, your medical practitioner acts selfishly, like anybody else. If his practice is mostly among the poor, he may like to consider how some governmental unit will pay for his professional visits to the sick poor. Naturally, he wants as little governmental control or interference as possible. (Is this very different from the old reiterated expression of the big business men?)

Some practitioners of medicine, however, would go the whole distance—the complete totalitarian state—so far as medicine is concerned. These, I think, we can safely call the Lefts. But what of the practitioners who only want pay from some public purse for each of their professional services? And what of the practitioners who only want open hospitals, whether private, community, state or federal, and payment for each separate professional service?

Of course, there are always troublesome details. Many communities are now in economic distress because of their relief programs which may or may not include expenditures for medical services. And what of this new term "medically indigent" and how far can public funds be extended to pay for professional services for those who use their in come for clothes, automobiles, radios and liquor? And what of hospitals, hospital salaries, medical schools and medical research? Shall we give up our privately endowed universities and hospitals? How irksome would be the supervision of the expenditure of public funds under these conditions? Probably only the out-and-out believers in the totalitarian state would want all medicine controlled by some governmental unit.

Doubtless, the great state universities have had a very beneficial effect on those privately endowed, and by the same token the privately endowed universities have had and will continue to have, I believe, a beneficial effect on those of the state. Personally, I cannot accept the pessimistic utterances of President Angell of Yale at the Harvard Tercentenary in 1936 when he solemnly declared that the trend of greatly increased taxation incident on these and other changes would probably close the privately endowed universities.

We can easily define the Lefts in medical practice as those who have been led to believe as they do either through conviction or from what they think is pressure to avoid destruction. But what of the Rights? Who are they? The exigencies of the situation do not permit the existence of the rugged individualism of practice of the earlier days. And most thinking persons accept and endorse much of the activity in medical practice by various governmental units. Some, indeed perhaps many, of these look askance at such activities as veterans' hospitals with the gradual loosening of the earlier restrictions.

A considerable group, no one knows how large, feels that while each step may be superficially justifiable, nevertheless, the trend taken with similar trends in other fields is now overdone. Are health and education different from crops, clothing and other necessities of life? Should one believe in governmental control of products and not of health? Of course, logic is impossible, and pol-

- 3 The ever present constipation is corrected by the use of enemas until the lower bowel is empty, and insistence upon either one bowel movement daily thereafter or repetition of the enema.
- 4 Fluid and sodium-chloride balance are restored, and acidosis is corrected.
 - a. An initial hypodermoclysis of 1500 cc of normal saline is given, followed by sufficient amounts daily to achieve and maintain fluid balance until the patient is retaining food and fluid by mouth
 - b. An intravenous infusion of 5 or 10 per cent glucose solution is administered by constant drip at a rate of from 30 to 40 drops per minute in sufficient amount to keep the urine relatively free from ketone bodies. This should be repeated at intervals of from 8 to 12 hours until the patient is retaining sufficient carbohydrates by mouth. If given slowly by constant drip, from 1000 to 1500 cc. or even more is well tolerated every 24 hours. After the fluid balance has been restored, the total fluid intake in glucose solution intravenously and saline by clysis should not exceed 3000 to 3500 cc. in 24 hours
- 5 Control of the starvation and resultant change. As vomiting persists, additional nutritional deficiencies in protein, minerals and vitamins come to play increasingly important roles in the pathology of the disease. With this in mind in each case, the duration and severity of the vomiting are considered, the dietary history is surveyed, and signs of vitamin deficiencies are sought. A well-balanced diet is provided with such supplementary vitamin concentrates as seem advisable. If the patient has reacted well to 12 or 24 hours rest, with parenteral fluids and sedatives, such a diet in small amounts and in the form of liquids is offered at hourly intervals by mouth. If there is still nausea, or if food taken by mouth is vomited, a generous dose of sedative is given by rectum, and one hour later a duodenal tube is passed through the nose. When this has been done, feedings of liquid diet are given at hourly intervals by drip at body temperature. We often begin with orange juice sweetened with corn syrup, milk, and eggnog (4 oz.) in succession at hourly intervals. A heaping teaspoonful of brewer's yeast concentrate is added to each milk feeding. If dietary history and study of the patient so indicate, larger amounts of vitamin B₁, ascorbic acid and liver extract administered intramuscularly are given. There is, occasionally, regurgitation of part of the feedings during the first 24 hours. This should not cause great concern, nor is it of much importance whether or not the tube has entered the duodenum, for excellent results are usually obtained when it rests in the stomach. The tube is left in place for 12 hours, and moderate doses of sedatives are administered through it at approximately 6-hour intervals. This method of feeding is continued for from 3 days to a week or more with gradually diminishing amounts of sedatives, following which the patient is given a well balanced diet of high vitamin content by mouth. When vomiting has ceased for 1 week and the pulse rate is well below 100, the patient is allowed to be up and about. On discharge, she is instructed concerning a well-balanced diet, rest, and proper control of the bowels. Brewer's yeast, small doses of sedatives and iron are continued for a considerable time.

Response to this treatment may be briefly exemplified by the following case history

Case 1 D A, a primipara, aged 23, entered the hospital in the 6th week of pregnancy. Vomiting had begun 11 days before admission, only small amounts of fluid had been retained. There was a history of a 10 lb loss in weight and marked constipation. The essential positive findings were signs of dehydration, a pulse rate of 88 to 110 and 3+ acetone and 2+ diacetic acid tests in the urine. The patient was treated as outlined. The acidosis was promptly controlled, and vomiting ceased during the first 24 hours after admission.

This patient's moderately severe vomiting responded ideally to the treatment. Although a large majority of such cases respond promptly to the treatment described, there is an occasional exception, and we believe that therapeutic abortion has its place in the proper treatment of this disease.

Should the patient continue to vomit in spite of a fair trial of four or more days of treatment as outlined, abortion should be considered. This is particularly true if the patient's pulse increases to a sustained rate of 110 or 120 beats per minute, if bile appears in the urine or clinical jaundice develops or finally if any one of the neurologic signs previously discussed appears. Such a course may be illustrated by the following clinical history.

Case 2 M. S. was a primipara of 28 in the 12th week of pregnancy who entered the hospital for severe vomiting of 4 weeks duration. The positive findings were incessant emesis with vomitus untinged with blood, tingling of hands and feet for 1 week, a pulse rate of 80 to 110 and marked dehydration and ketonuria. The patient failed to respond to treatment, and incessant vomiting continued in spite of attempted tube feedings. She was then given large doses, first of estrin and later of suprarenal cortex extract, but with no improvement. Finally, catheters were inserted into both ureters as suggested by Hayes.⁶ The patient failed to improve in spite of all treatment. The pulse rate continued to increase steadily and rose to 160. Therapeutic abortion was performed vaginally on the 7th day after admission. On the 2nd and 3rd postoperative days the patient developed a mild psychotic state, which was transient. She was discharged 8 days later with a pulse rate of 90 and no complaints.

It should be emphasized that the condition of this patient was rapidly becoming desperate, and that all methods of medical treatment, including endocrine therapy, were failing. In retrospect, it seems that it would have been better to resort to therapeutic abortion forty-eight to seventy-two hours earlier.

Severe or neglected cases are characterized by continuous vomiting, usually of more than four weeks' duration, with marked to extreme loss in weight, dehydration and acidosis. The pulse is accelerated, and the rate is usually above 120. Jaundice may be present. Bleeding, spongy gums are a frequent finding, other signs suggestive of scurvy, such as hematuria and muscle and periosteal pain, may be encountered. Hemorrhages of the ocular fundi are occasionally found. The neurologic signs and symptoms may be well established. Men-

some confusion and harm. To be sure, psychic disturbances are among the most important of a large group of extrinsic factors which aggravate the disease. However, there can be no doubt that many physicians have been prone to dismiss vomiting of pregnancy as a neurotic disturbance, without adequate treatment. We must emphasize that each patient with hyperemesis, if treatment is neglected, has a potentially dangerous or even fatal disease.

LABORATORY FINDINGS

Most important of the laboratory procedures is examination of the urine. Except in mild cases it should be examined twice a day until the disease is under control. The volume and specific gravity should be determined, tests should be made for acetone, diacetic acid, albumin, sugar and bile, and the sediment should be examined.

Blood samples taken for study when the patient is markedly dehydrated must be interpreted with this fact in mind. Abnormally high hemoglobin values and red-blood-cell counts may be due to blood concentration. Similarly, the nitrogenous constituents of the blood are many times found to be elevated. The latter usually return to normal values promptly when fluid and sodium-chloride balances have been restored, while re-examination for hemoglobin and the red blood cells often reveals a relatively severe microcytic, hypochromic anemia which had been masked by blood concentration. Marked decrease in the carbon-dioxide combining power of the blood in many instances precedes a fatal outcome, yet, death may occur in patients with normal or even elevated values.

CLASSIFICATION

There are two interrelated variables in this disease—the *severity* and the *duration* of the vomiting. In order to formulate the best treatment for each individual case, both variables must be considered. Consequently, the cases have been classified as follows:

Vomiting of early pregnancy

Mild (morning sickness), no significant interference with nutrition

Moderately severe, duration from 1 to 4 weeks

Severe and neglected, duration over 4 weeks

Vomiting of late pregnancy. We do not believe that this is the same disease as that occurring early. It is often associated with severe pre-eclampsia, intestinal obstruction, abdominal inflammatory disease or lesions of the liver.

TREATMENT

Vomiting of Early Pregnancy

The treatment of the vomiting of early pregnancy may be either medical or surgical. We feel that both forms possess definite limitations. In general, the management may be outlined as follows:

Mild cases are characterized by considerable nausea and only occasional vomiting. In many instances there is only morning sickness, while in others the nausea and vomiting occur in the afternoon, or only with excitement or fatigue. The majority of patients never get beyond this stage, and there is no significant disturbance of nutrition. The treatment is medical, the most important measures being:

1. Frequent small feedings of any type of food which appeals to the patient. A high-carbohydrate, well-balanced diet is encouraged, and fatty, fried or indigestible foods are eliminated.
2. Avoidance or correction of constipation, with use of mild cathartics and enemas when necessary.
3. Removal of environmental factors which might aggravate the condition.
4. Rest, avoidance of excitement and fatigue, and sedatives when indicated.

Moderately severe cases are characterized by marked persistent nausea and vomiting with retention of very little or no food or fluid of from one to four weeks' duration. These patients show a loss in weight, dehydration, ketonuria and a beginning increase in pulse rate, and occasionally a small amount of bile in the urine. Nearly all are markedly constipated, and many show slight temperature elevation, which rarely exceeds 100°F. Occasionally there are one or more signs of beginning mental and neurologic lesions, such as defective memory, drowsiness, irrationality, nystagmus, decreased or absent tendon reflexes, atrophy and weakness of the muscles of the extremities,—particularly the extensors,—loss of sphincter control and sensory skin changes. We have included in this group only patients in whom the duration of the vomiting was four weeks or less, since clinically this appears to be a good dividing line between the moderately severe cases and those which are likely to be gravely ill. The management of such cases may be outlined as follows:

1. The patient must be hospitalized, and complete physical and neurologic examinations must be performed.
2. Treatment of the hyperirritable nervous system and the psyche is begun.
 - a. The patient is isolated from all friends and relatives as well as from oversolicitous attendants.
 - b. Measures are taken for the adjustment of mental problems which seem to be contributory factors, that is, illegitimacy, determination to be aborted or problems concerning husband and family.
 - c. Sedatives are given in sufficient quantity to cause cessation of vomiting and at first to induce sleep. Later, the doses are diminished. Phenobarbital, bromides and pentobarbital are preferred. It is usually preferable to give the medication by rectum following an enema. From 3 to 9 gr of pentobarbital are ordinarily required for proper control.

trial on this regime, therapeutic abortion was performed, in severe and desperate cases, it was usually done as soon as fluid balance had been restored by parenteral fluids

Table 1 *The Results from the Treatment of Moderately Severe and Severe Cases of Vomiting of Pregnancy at the Boston Lying-in Hospital*

	1930-1933	1934-1937
Number of deliveries	12 675	14 600
Number of vomiting cases	85	91
Incidence	0.63%	0.62%
Cases treated without therapeutic abortion	65	86
Deaths	4	0
Mortality	6%	0%
Cases treated with therapeutic abortion	13	3
Deaths	3	0
Mortality	23%	0%
Cases discharged against advice	7	2

Since 1933 the regime here outlined has been substituted. The results, in the moderately severe and severe cases, compared with the previous four-year period, are given in Table 1

CONCLUSIONS

- 1 The cause of the vomiting of early pregnancy is unknown
- 2 The pathologic lesions are those of starvation, resulting from sustained loss of body fluids, proteins, minerals, chlorides, carbohydrates and vitamins
- 3 An arbitrary classification on the basis of

the severity of the disease has been presented, and an attempt has been made to outline what appears to be the most satisfactory treatment for each group. A medical regime which has resulted in few failures has been suggested.

4 Therapeutic abortion is a life-saving procedure in early cases which fail to respond to a thorough trial of medical treatment. Clinical signs and symptoms indicative of such failure are emphasized.

5 In contrast to previous views on the use of therapeutic abortion in cases of neglected and long-established vomiting (severe type), we believe that immediate abortion is not indicated, but is best postponed for two weeks or more until medical treatment has restored the patient to a proper state of nutrition. If after this preliminary preparation therapeutic abortion is still to be considered, because of persistent polyneuritis, it may be much more safely performed.

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LOW-THIGH AMPUTATION

Technic Employed in Elderly Patients, Particularly Those with Advanced Peripheral Vascular Disease or Diabetic Gangrene

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AMPUTATION of an extremity is performed for one of two purposes—to save life or to improve function. In older patients, particularly those who exhibit advanced peripheral vascular disease, or diabetic gangrene of the lower leg and foot, amputation frequently has to be considered, and the operation when carried out is done primarily to save life. Either because the change in the peripheral vessels is such that circulation cannot be sufficiently improved to save the part, or because diabetic gangrene, especially on account of a deficient circulation, makes it impossible to control the infection, the radical procedure of amputation is indicated.

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The decision for or against amputation is often an extremely difficult one. Each patient presents a distinct problem. Consultation with the medical and the surgical services is always obtained, so that the patient has the benefit of three or more independent opinions.

The present paper is based upon a group of 38 elderly patients who, between January, 1932, and January, 1937, submitted to low-thigh amputation. The type of lesion for which they were operated upon is shown in Table 1. Exclusive of the fourth group (patients with thromboangitis obliterans), the youngest patient was fifty years old, the eldest was seventy-nine and the average age was sixty-two. In the fourth group the average age was forty-two. Incidentally, all the patients in this group

tal symptoms such as confusion, irrationality and hallucinations may appear. Nystagmus, diminished or absent tendon reflexes, marked wasting of the extremities, extensor paralysis, sphincter incontinence and sensory changes may be observed. The concentrated urine, in addition to ketone bodies, may show bile and albumin, as well as casts and blood in the sediment.

These patients present desperate problems. The mortality is probably well above 25 per cent, and past experience indicates that any surgical procedure adds materially to the risk. Immediate therapeutic abortion may well increase rather than decrease the mortality. Fortunately, in many patients who have progressed to this state the vomiting has diminished in intensity or has ceased, so that with the aid of the duodenal tube they may be fed. This is particularly true of patients who have developed polyneuritis.

With realization of the extremely high mortality which had attended immediate therapeutic abortion in this group, we decided four years ago to adopt a more conservative policy. A number of these cases have been treated in the manner described above for the moderately severe ones, with particular emphasis on prolonged tube feedings of a diet rich in protein, carbohydrate and vitamins, supplemented by concentrated sources of vitamins B₁, C and G in the form of brewer-yeast concentrate, ascorbic acid and liver extract given intramuscularly. Improvement has been marked and none of the patients have died, although in 2 with marked polyneuritis no significant neurologic improvement occurred until after the pregnancy had terminated. This point is well illustrated by the following case history.

Case 3. A. S. was a secundipara, aged 30, who was admitted in the 19th week of her pregnancy. Severe vomiting had resisted home therapy for 12 weeks, but 4 weeks before admission it had nearly ceased and an intractable diarrhea had begun. Since that time there had been complete paralysis of the lower extremities and marked weakness of the hands. The patient had lost 50 lb. in weight. The positive findings were anorexia, a sustained pulse rate at rest of 120 to 130, marked wasting of the muscles of the lower extremities, with absent deep-tendon reflexes and bilateral foot drop. The patient was slightly euphoric, and there was incontinence of both urine and feces. The urine showed a 4+ test for acetone. The blood showed moderate anemia, but the carbon-dioxide combining power was normal. This patient was treated as outlined. She was kept in the hospital for 4½ weeks. The diarrhea promptly subsided, the appetite improved, there was a gain in weight, and the pulse rate decreased slightly. The patient continued with complete bed rest at home, and in addition to a high vitamin diet took large doses of brewer-yeast concentrate until delivery 4 months later. In spite of these measures, the neurologic signs and symptoms did not improve significantly. Following delivery

neurologic improvement was dramatic, and 6 weeks post partum the patient was able to walk about the house.*

It is our feeling that in this type of case immediate therapeutic abortion is contraindicated. Ideally, we believe these patients should be fed a diet high in protein, carbohydrate and vitamins, with supplementary sources of vitamins, for at least two weeks before interruption of the pregnancy is considered.

The uterus should be emptied with the least possible trauma. If the cervix is firm, a small gauze pack should be inserted and left in for twenty-four hours. This results in a softening of the cervix, which will make subsequent dilatation and curettage easy. If the pregnancy has entered the second trimester, it is usually best terminated by vaginal hysterotomy. The added shock of abdominal hysterotomy appears to make this procedure undesirable.

The choice of anesthesia is important. Avertin should not be used. Morphine or the barbiturates may be used for preliminary medication. Inhalation anesthesia is to be avoided if possible, particularly chloroform and ether. Cyclopropane or ethylene is suitable. Sacral block with novocain or, on occasion, low-spinal anesthesia, is to be preferred.

Vomiting of Late Pregnancy

This is considered by many as a separate disease. Certainly it is often associated with pre-eclampsia, liver lesions or acute abdominal lesions. It is the feeling of obstetricians of long experience, however, that vomiting of late pregnancy from whatever cause is poorly tolerated. In the absence of demonstrable abdominal disease or pre-eclampsia, a short trial of medical treatment as previously outlined is permissible. However, if vomiting persists induction of labor should be considered.

RESULTS

Prior to 1934, patients with vomiting in early pregnancy were treated with a regime of which the essentials were isolation, no demonstration of sympathy, large amounts of parenteral saline and glucose (up to 6000 cc. in twenty-four hours), rectal taps with sedatives and feedings by mouth consisting of 8-ounce quantities of milk, malted milk and water in succession at hourly intervals. The strict hourly feeding schedule was maintained, and if significant vomiting recurred, all food was discontinued until vomiting had ceased for twenty-four hours, when feedings were resumed. If the vomiting could not be controlled after reasonable

Recent preparations of crystalline vitamin B₁ have been made available for parenteral clinical use. It may be that very large doses of this substance would have a more decided influence upon the polyneuritis which complicates prolonged vomiting than do preparations fed by mouth.

divided in the line of incision about 1 cm distal to the skin edges, as described by Kirl.

The mesial hamstring muscles and tendons are next divided, through blunt dissection in the popliteal space it is then easy to recognize, isolate, clamp and cut the popliteal vessels and nerves (Fig 2). With an amputation knife the remaining soft tissues are quickly severed. Comparatively slight bleeding results. The synovial membrane lining the suprapatella pouch is then cut away. Gentle

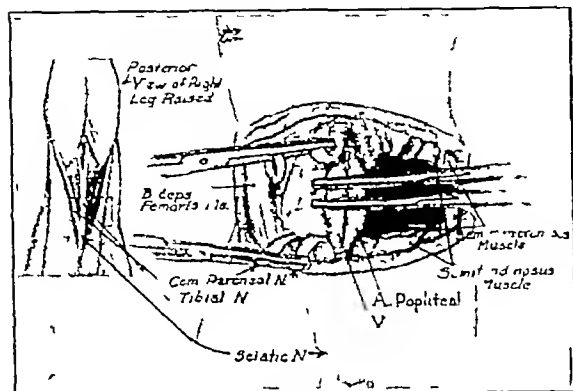


Figure 2 Following division of the medial hamstring muscles blunt dissection in the popliteal space permits easy recognition, clamping and cutting of the popliteal nerve and vessels. As described in the text, the saphenous vein is similarly clamped. With this technic a tourniquet is unnecessary. The insert shows the anatomy of the popliteal space, as seen at operation the hip flexed to 90° and the knee joint extended.

traction is applied to the sciatic nerve trunk, which is then divided with cautery, as suggested by McKuttrick. This technic is distinctly preferable to the use of ligatures and to nerve injection with absolute alcohol.

After exposure of the femoral shaft the periosteum is stripped from the bone toward the knee with a broad, sharp elevator, beginning 1 cm above the selected point of bone division—the aperiosteal type of amputation. Then the shaft of the femur is cut through, and the resulting sharp bone edge is beveled off with a rasp. The popliteal vessels are ligated twice with heavy silk.

Following low-thigh amputation, the femoral shaft tends to be displaced to the lateral side of the stump. For successful function of the prothesis it is most important to prevent such a displacement. This is simply accomplished by holding the femur in the mid-thigh position, and then passing anteroposterior silk ligatures through the muscles close to the bone on the medial and lateral aspects of the femur, this creates a muscular tunnel which incloses the shaft of the femur and prevents displacement to either side of the stump (Fig 3).

The anatomic relation of the soft parts to the

femur is now considered, and the key points for approximation of the skin edges are identified by clamps applied to the subcutaneous tissue. A careful survey is made for all bleeding points, which are clamped and cauterized. The larger superficial vessels, such as the saphenous veins, are tied with plain catgut. The quadriceps tendon is then sutured with chromic catgut to the posterior deep fascia at the midline so that the tendon lies directly over the bone end. This heavy tendon provides a most satisfactory coverage of the bone and permits weight-bearing on the end of the stump.

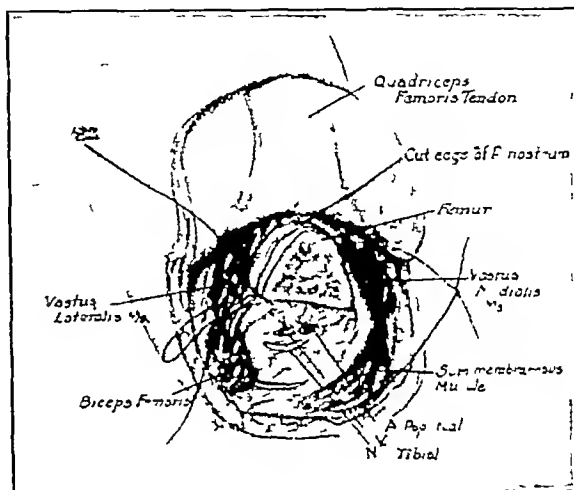


Figure 3 Prevention of lateral displacement of the femoral shaft by means of anteroposterior silk sutures deeply placed in the muscle mass on either side of the bone, thus creating a muscular tunnel which encloses and holds the femur in midline of the thigh.

Note that the distal centimeter of the femoral shaft is completely denuded of periosteum, also that the femur here is of a triangular shape since it was divided, as described in the text a few centimeters proximal to the cartilaginous margin on the anterior femoral surface. The next step in closure of the wound is suture of the quadriceps tendon to the midline posterior deep fascia, thus covering the end of the bone with this tendon.

Thereafter, the subcutaneous tissue and finally the skin are closed with interrupted sutures, the former with catgut and the latter with silk. Continuous sutures are not favored, as with their use an unnecessary amount of suture material remains in the wound.

Drains are not employed except in the presence of severe leg infection or in the rare instances of excessive oozing from the cut surfaces of the stump, sometimes seen in pronounced secondary anemia. In the majority of these amputations drainage is not necessary, in fact it is definitely contraindicated, as drains tend to create a sinus tract.

Following closure of the wound, a large, loose gauze dressing is applied and the entire stump is snugly covered with sheet wadding, followed by

had had prolonged medical treatment as well as lumbar ganglionectomy up to two years previous to amputation. It will be noted that patients suffering from arteriosclerotic gangrene form the largest single classification. In the entire series there was 1 death due to sudden rupture of an aneurysm of the abdominal aorta two months after amputation.

A discussion of the various levels of amputation is not indicated here, except to point out that

Table 1 *Reasons for Amputation.*

DIAGNOSIS	NUMBER OF PATIENTS	DEATHS DUE TO OPERATION
Arteriosclerotic gangrene	12	0
Diabetic gangrene and arteriosclerosis	9	1
Diabetic gangrene	6	0
Thromboangiitis obliterans	3	0
Neoplasm	4	0
Miscellaneous	4	0
Tuberculous knee joint	2	
Pathologic fracture	1	
Traumatic thrombosis of tibial vessels	1	
Total	38	1

amputation below the knee is rarely to be considered in older patients with diabetic gangrene of the lower leg and foot, unhealed lesions of the foot due to inadequate circulation, or a combination of these two conditions. Furthermore, after amputation through the lower extremity in older patients there is concern about future function, especially in the younger ones. The use of an artificial limb is always trying for older people. Nevertheless, with the most important aid of an expert maker of artificial limbs, we were successful in fitting 37 patients in this series with a prosthesis which functioned—a difficult but well worth-while task.

Having decided upon a thigh amputation for a case in this group, selection of the type of operation lies essentially between a Gritti-Stokes procedure and amputation through the lower thigh. For these patients, particularly in the presence of deficient circulation or diabetic gangrene, we believe that the latter procedure is preferable, for these reasons:

- 1 It is simpler and safer.
- 2 There is consistent primary union.
- 3 Weight can be borne on the end of the stump as a result of suturing the heavy quadriceps tendon over the femoral shaft to the posterior deep fascia (Kirk).
- 4 Osteogenesis (patella to femur) is not required.
- 5 The resulting stump affords excellent leverage for a prosthesis.

Low-thigh amputation as here reported means division of the distal femur through the expending bone shaft 3 to 5 cm. above the proximal cartilaginous margin on the anterior femoral surface.

Since this group of relatively old patients has reacted so favorably to the operation, we shall describe the details of the procedure, which is the method now employed in the Lahey Clinic.

A proximal tourniquet is not applied, since any degree of obstruction to circulation may delay healing and because with the technic described very little blood is lost. Every attempt is made to drain the leg of blood by elevating the extremity, beginning with the time the patient is placed on the operating table. In the *absence* of infection this step is supplemented by a progressively tight elastic bandage on the foot and lower leg as far up as the knee. This bandage squeezes nearly all the blood out of the lower half of the leg. In the *presence* of severe lower leg infection a tourniquet is applied very tightly just below the knee.

The operation is performed with the patient lying supine, while an assistant holds the extremity flexed at the hip to a right angle, the knee extended (Fig. 1). This position offers ready

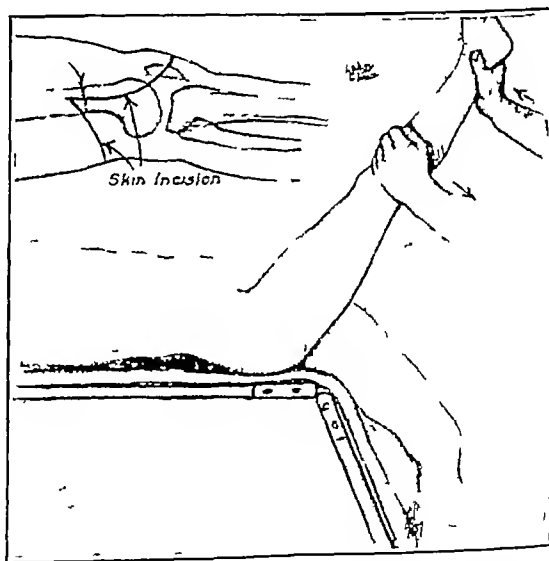


Figure 1 Illustrating the position in which the leg is held for amputation. The advantages are facility of approach to the operative field as well as drainage of blood from the extremity. The insert shows line of incision.

access to the site of the incision and greatly facilitates the entire procedure.

The incision for the anterior skin flap passes through the mid-patellar region, while the posterior flap is outlined slightly proximal to this level (Fig. 1). The use of flaps is preferred to the guillotine type of incision because with them there is a neater-appearing stump and it is easier to cuff back the soft parts for exposure of the bone. After the saphenous vein has been clamped and cut, the deep fascia on the posterior aspect of the thigh is

INTRAVENOUS EVIPAL—SODIUM ANESTHESIA IN UROLOGIC SURGERY

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EVIPAL SODIUM was first used as an intravenous anesthetic at the Peter Bent Brigham Hospital in 1934. At that time it was felt that though the pharmacology of this new anesthetic had been inadequately studied,¹ the extensive experiences of German and British investigators justified its clinical trial. In a previous communication² our experience with 300 cases was reported. The importance of individualization in the use of evipal sodium was emphasized. Certain indications and contraindications were discussed and a technic of administration which had proved safe and practical was outlined.

In the present paper, particular attention is given to the applicability of evipal anesthesia to urologic practice. No branch of surgery more frequently requires an anesthetic for procedures of short duration than does urology. On the other hand, no branch of surgery deals with such elderly, debilitated or profoundly ill patients. For these reasons the use of evipal in the field is of particular interest and merits special scrutiny.

Table 1 *Operative Procedures Performed under Intravenous Evipal Anesthesia.*

OPERATIVE PROCEDURE	NO. OF CASES
Total cystectomy	1*
Suprapubic prostatectomy	4*
Suprapubic cystostomy	3*
Vaginal cystostomy	1
Transurethral resection	9
Orchidectomy	1
Ureteral transposition	1*
Excision of hydrocele	3
Excision of varicocele	1
Circumcision	12
Cystoscopy	63
Dilatation of urethra	11
Cauterization of urethral caruncle	1
Implantation of radon seeds	3
Incision and drainage of epididymitis	11
Incision and drainage of penurethral abscess	3
Resuture of wound	3
Removal of prostatic bag	5
Cauterization of cervix	2
Change of suprapubic catheter	2
Hemorrhoidectomy	2
Total	142

*Used to supplement local or spinal anesthesia.

Table 1 gives a list of the operative procedures which have been performed under intravenous evipal anesthesia. The technic of administration was identical with that previously outlined.² As might be expected, there was a ratio of 3 males

to 1 female in this series. The youngest patient was nine years of age, the oldest eighty-five. The patients in the younger group required distinctly more anesthetic than did those in the older group. Thus the average dose required for cystoscopic examination in patients in the third and fourth decades of life was 8 cc., whereas in the seventh and eighth decades it was 4.5 cc. Although age is a guide to the amount of anesthetic required, individual idiosyncrasy to the drug always makes the fractional method of administration imperative.

The largest dose of evipal used in this series was 28 cc. In this instance satisfactory anesthesia was obtained with difficulty and lasted only twenty minutes. After the operation, however, the patient remained comatose for four hours. We now feel that it is a mistake to continue the drug in a patient who is obviously highly resistant to it, if satisfactory anesthesia is not obtained with 10 cc., another anesthetic had best be used. However, if satisfactory anesthesia is obtained with 10 cc. but the operative procedure is prolonged, we have no hesitancy in maintaining the anesthesia with repeated doses of evipal. An amount larger than 15 cc. is seldom used. In 1 case in our series excellent anesthesia was maintained for fifty minutes with the use of only 9 cc. The average dose was 7.3 cc.

Sixty-three cystoscopies have been performed under evipal anesthesia. In 62 of them the anesthesia was highly satisfactory. In only 1 case, that of a child of nine, was the anesthesia of a duration insufficient to permit a satisfactory examination. In young, excitable patients, and in cases where painful instrumentation, such as dilatation of a urethral stricture, is indicated, preliminary medication with 15 mg. ($\frac{1}{4}$ gr.) of morphine is always given hypodermically. Spasmodic coughing during cystoscopy under evipal anesthesia has been reported,³ but we have had no difficulty in this respect. In our hands evipal has proved a safe and efficient method of inducing narcosis, the rapid, smooth induction, the ease of administration and the usually prompt recovery render it ideal. It must be emphasized, however, that the drug is a general anesthetic and must not be used unless the necessary personnel and equipment to care for the patient are available. An assistant in addition to the one administering the anesthetic

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an Ace or Bender bandage. Dressings are renewed when indicated, but the bandage is continuously applied during the first two weeks, as by this maneuver the stump is more rapidly shaped and accumulation of serum is prevented. The use of this type of support is a valuable aid in rapid mobilization of the patient, and makes possible earlier application of the prosthesis. Care is also exercised to maintain the stump in the position of complete extension at the hip joint for progressively longer intervals each day, in order to prevent hip-flexion deformity.

The next step is that of fitting the pylon, a temporary appliance designed to shape the stump more rapidly for the eventual permanent prosthesis, and also to hasten the patient's discharge from the hospital. Figure 5a shows the wearing of

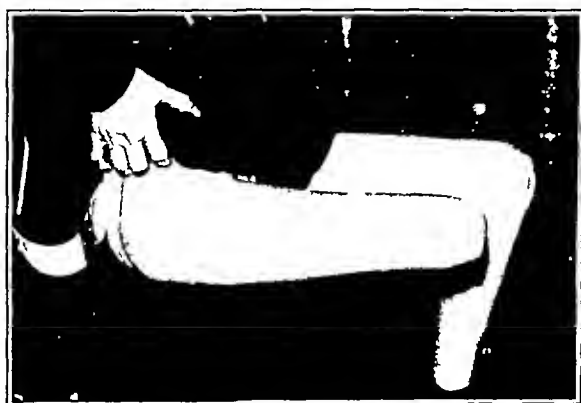


Figure 4 Postoperative photograph illustrating the length of the thigh stump as compared with the non-operated leg. The patient walks well with a pylon (Fig 5b).

this pylon. It means less immediate expense to the patient, and in the hands of an expert artificial-limb maker permits necessary adjustments during the ensuing months until the patient can be fitted with a permanent artificial leg. This pylon has the further advantage that if the patient cannot afford an artificial leg he can continue to walk with the pylon most satisfactorily. As a rule, the pylon is applied and the patient starts weight-bearing thereon by the end of the second postoperative week, occasionally in seven to ten days. The pylon is worn three months, or until no further shrinkage of the stump occurs. A permanent prosthesis can then be measured and fitted.

SUMMARY

A technic employed for low-thigh amputation is described. By this term is understood division

of the distal femur a few centimeters above the proximal cartilaginous margin on the anterior femoral surface.

This type of low thigh amputation is preferred to the Gritti-Stokes operation when treating old patients, particularly those individuals with advanced peripheral vascular disease or diabetic gangrene of the lower leg and foot. The procedure is simpler and safer, there is consistent primary



Figure 5 a Photograph of a patient fitted with a pylon, showing details of this prosthesis.

b Similar photograph (compare with Fig 4).

The pylon is applied between the tenth and the fourteenth postoperative days. It is a temporary prosthesis designed to shape the stump rapidly for fitting with the permanent artificial leg, and permits the patient's discharge from the hospital.

union, weight can be borne on the end of the stump, osteogenesis—patella to femur—is not required, and finally the resulting stump affords excellent leverage for a prosthesis.

Thirty-eight amputations have been performed, with 1 death two months after operation, due to rupture of an aneurysm of the abdominal aorta.

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HUMAN AUTONOMIC PHARMACOLOGY

XVI Benzedrine Sulfate as an Aid in the Treatment of Obesity

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WHEN energy intake in the form of food is greater than energy output, the excess potential energy is stored as body fat. If imbalance between food intake and energy output occurs, a change in weight must take place, whether it is to be a gain or a loss depends on the direction of the imbalance. From this point of view, the cause of obesity may be a defect of the appetite-regulating mechanism, rather than an alteration of metabolism. The perfect appetite mechanism will adjust itself to all changes of energy output, or metabolism, by a corresponding change in energy, or food intake, and thus the body will maintain its usual weight. Defect of the appetite mechanism will create imbalance in the energy output-intake relation, and a change in weight will result.

The factors which govern the appetite may be divided into the following groups: (1) physical status, particularly with reference to the endocrine glands, (2) social habits, and (3) psychologic influences. The effect of physical status on the appetite may be considered under the two aspects of disturbances due to acute or chronic organic disease, and disturbances due to metabolic abnormality as mediated through the endocrine glands. With regard to the former, little comment is needed, as the appetite disturbance of the sick is a matter of common knowledge. With regard to metabolic abnormalities, the bulimia of hyperthyroidism and the anorexia of Addison's disease may be mentioned as contrasting pictures. A more subtle disturbance of metabolism, mediated especially through the pituitary gland, has been invoked by many writers from von Norden onward, and has given rise to the concept of exogenous versus endogenous obesity.¹

In this connection, the work of Newburgh and his associates² shows that energy exchange is in no way different in a proved case of pituitary disease (Cushing's syndrome) from what it is in normal persons. The loss in weight caused by any given reducing diet may be predicted for any period with great exactness. Furthermore, in patients suffering from myxedema, where the depression in energy metabolism is greater than it is in

any other disease, striking obesity is the exception.

All visceral functions, including the appetites, are strongly modified by social habits. The appetite for food and eating have become almost as much social as they have physiologic and psychologic. People eat without particular desire under the influence of social feeling, as at parties and banquets. They are also forced to defer eating when the desire for food is very great, because of social conventions as to the serving of meals. In addition, the social and economic environment makes food and drink easily accessible to many without physical exertion.^{3, 4}

The relation of physiologic, pathologic and sociologic phenomena to the causation and maintenance of obesity having been pointed out, there remains for discussion the effect on the appetite of numerous psychologic influences. In previous papers,^{3, 4, 5} one of us (A. M.) has described a syndrome as part of the neurosis known as anhedonia. This symptom complex consists in a diminution, even to the point of disappearance or antagonism, of satisfactions normally obtained from life activities, and in a loss or distortion of the appetites and desires. The appetites involved are hunger, thirst and sex, desire for rest and recuperation, and desire for social relations, work and entertainment.

When satisfaction becomes impaired and there is no corresponding diminution in appetite, as is the case in the earlier stages of anhedonia, there is a restless seeking for stimulation in order to secure the longed-for satisfaction. The mood becomes unpleasant, and the expression of it may take many forms. One of such expressions, commonly seen in sedentary persons, is frequent eating. People who are restless because their lives are unsatisfied may be seen nibbling candy, nuts, crackers or the like. The ingestion of food becomes in a certain measure an escape. Food is easily obtained, and eating is often merely a something-to-do which has become a prime need.

The etiology of obesity and treatment of the obese person therefore appear to involve a careful consideration of the anhedonic syndrome, since in many such patients there is an associated neurosis of varying degree. A similar concept has been elaborated by Newburgh and his associates,⁶ who have pointed out that obesity is in the main the outcome of a perverted habit and that there is "dull-

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must be present, and a supply of oxygen, carbon dioxide and coramin must be on hand

In the operating room evipal has proved equally efficacious. It is well suited for such procedures as excision of a hydrocele, incision and drainage of abscesses, implantation of radium and transurethral prostatic resection. It is particularly valuable as a supplement to local or spinal anesthesia. In young individuals, on the other hand, the relaxation is frequently inadequate for operations on the genitals. For this reason we feel that for circumcision evipal is not so satisfactory as gas-oxygen or even local anesthesia.

Contraindications to the use of evipal sodium have not been clearly defined. In our previous paper we listed them as liver damage, low blood pressure, the presence or imminence of shock, marked debilitation and asthma. There are certain other conditions frequently encountered in patients with urologic symptoms which require special consideration, such as sepsis, hypertension, cardiac or renal insufficiency, anemia and senility. In our series 30 patients were profoundly septic, of these, 17 cases were acute and 13 chronic. Long-standing, severe urinary sepsis is in our opinion a contraindication. This statement is based on the fact that in such cases the recovery period was frequently greatly prolonged, even after small doses. This prolonged period of coma, often lasting several hours, may predispose to pulmonary complications. Acute infection, on the other hand, presents no contraindication, except that larger doses of the drug may be necessary, and here again, with increasing doses, one finds a proportionately greater increase in the duration of the recovery period.

Hypertension in the absence of cardiac failure is no contraindication to the use of evipal. There were no untoward reactions in 8 of our patients, who had a systolic blood pressure of over 200 and a diastolic pressure of over 100. But it should be remembered that evipal may cause alarming falls in blood pressure, and in major operative procedures this may predispose to shock or collapse. The finding of an enlarged heart or cardiac murmurs does not prohibit the use of evipal but decompensation is a definite contraindication. We have never used evipal in the presence of cardiac failure, but this has been done and fatalities have been reported.⁴

Patients with renal insufficiency may be divided into two groups, acute and chronic. In the acute cases we believe that the use of evipal had best be avoided. In 2 such cases we have noted profound depth of anesthesia and a markedly delayed recovery. One patient remained unresponsive for thirty-

six hours after the administration of 9 cc. Chronic renal insufficiency, however, seems to be less dangerous. In our series, 13 patients had renal insufficiency as evidenced by a diminished phenolsulfonphthalein excretion and an elevated blood nonprotein nitrogen. These patients received evipal in doses of from 4 to 10 cc without untoward reactions. Thirty-two patients with diminished phenolsulfonphthalein excretion but with normal blood nonprotein nitrogen received evipal in doses of from 5 to 12 cc. In this group, also, no ill-effects from the anesthetic were noted. Inasmuch as evipal is often desirable for cystoscopic examinations when determination of renal function is necessary, it is essential to know whether it produces a temporary cessation of renal function. In patients with normal renal function we have observed no delay in the appearance time of phenolsulfonphthalein or indigo carmine injected intravenously during evipal anesthesia. Finally, it may be noted that we have given evipal to 3 patients with chronic nephritis and have observed no ill-effects. This apparent immunity of the kidney suggests that as a basal anesthetic in patients with renal damage evipal sodium may possess advantages over avertin.

Anemia or senility per se constitutes no contraindication to evipal. In 11 cases the red blood-cell count was between 1.8 and 3.5 million, but no unfavorable reactions occurred. It is true, however, that in such individuals a smaller dose is adequate. We have given the drug in small doses without complications to 12 patients over seventy years of age.

SUMMARY

Intravenous evipal anesthesia has proved highly satisfactory in urologic practice at the Peter Bent Brigham Hospital. It possesses the advantages of ease of administration, rapid induction and, usually, a prompt recovery. Acute or moderate degrees of chronic sepsis, hypertension, chronic myocarditis without cardiac failure, chronic renal insufficiency, anemia and senility have not proved to be contraindications to the use of evipal. It must always be employed with caution and under controlled conditions. Long-standing profound sepsis, acute nitrogenous retention, cardiac failure and liver disease, on the other hand, are absolute contraindications to its use.

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visit, in order to prevent dangerous self-medication. No patient was given a prescription for the drug or was told its name.

Tolerance to the drug, so far as its effect on the appetite was concerned, did not seem to develop, for substitution of placebo tablets or omission of the drug always caused a return of increased appetite, even after months of administration.

Out of the group of 17 cases, the complete histories of 8 are given below. Table 1 gives the

Table 1 *The Effect of Benzedrine Sulfate as an Aid in the Treatment of Obesity*

CASE NO.	SEX	INITIAL WEIGHT	PERIOD OF OBSERVATION	TOTAL WEIGHT LOSS	AVERAGE WEEKLY WEIGHT LOSS	MAXIMUM DAILY DOSE OF BENZEDRINE
		lb	weeks	lb	lb	mg
1	F	171	17	29	1.7	22.5
2	F	210	15	17	1.1	27.5
3	F	194	23	26	1.1	22.5
4	F	216	6½	11½	1.7	25.0
5	F	145	10	11	1.1	13.0
6	F	217	6	7½	1.3	22.5
7	M	316	12½	54	4.3	30.0
8	F	189	20½	32	1.5	20.0
9	F	150	19	27	1.4	22.5
10	F	231	25	48	1.9	27.5
11	F	157	10	18	1.8	20.0
12	F	176	10	0	0	22.5
13	F	135	12	13	1.1	22.5
14	F	145	14	9	0.6	30.0
15	F	151	10½	20½	1.9	17.5
16	F	207	10	10	1.0	27.5
17	F	179	10½	13½	1.3	15.0

factual data for the entire group. Although we here stress the utilization of benzedrine in cases of obesity which are associated with varying degrees of anhedonia and neurosis, the drug was found to be of as much benefit in cases of obesity without any obvious neurotic background, such as a case associated with narcolepsy and several cases with endocrine stigmas.

CASE REPORTS

Case 1 (obesity with psychoneurosis). A housewife of 24 complained of being overweight and of abnormal fatigability. She had gained 25 lb since the birth of her baby 7 months before. For over a year she had noted increased fatigue, particularly on wakening in the morning. The past history was otherwise negative.

The height was 62 in. and the weight 169 lb (50 lb overweight). There was no deviation from normal except for the generalized obesity. The blood pressure was 110/64. The urine was free of albumin, sugar and abnormalities of the sediment.

The patient was placed on the standard low-calorie diet. She did not return again until 11 months later, when she weighed 171 lb. She stated that she felt tired and sleepy all the time, had become very nervous and had frequent crying spells. Examination at this time revealed no change from the previous one. The blood pressure was 110/60.

In view of the fact that the patient was suffering from a psychoneurosis, she was given both stimulating and sedative therapy. She was placed on benzedrine sulfate, 5 mg on arising, 5 mg at noon and 2.5 mg at 5 p. m., and Amytal (isoamylethyl barbituric acid), 15 mg at noon, supper and bedtime. In addition, she was given the standard low-calorie diet. During the course of the next month she was seen at weekly intervals and showed a weight loss of 16 lb. Her nervousness gradually decreased,

her crying spells disappeared and she stopped munching between meals. She had no difficulty in getting a satisfactory night's sleep. She stated, "I am not hungry any more." For the first time in her life, however, she became slightly constipated. During this period the blood pressure and pulse rate remained unaltered.

At the close of the 1st month of therapy the patient was given a 2 weeks supply of the tablets and told to return at that time. This she was unable to do, so that she was not seen again until 6 weeks later. At this visit she stated that following the omission of the benzedrine tablets she had had a marked increase in appetite. I kept nibbling all day. When I take the tablets [of benzedrine] I have to force myself to eat. Whereas she had lost 16 lb in her 1st month of treatment, during the subsequent 6 weeks she lost only 5 lb. During the period of benzedrine therapy, she finally attained a dosage of 10 mg on rising, 7.5 mg at noon and 5 mg at 5 p. m. The tablets of isoamylethyl barbituric acid were omitted when the nervous symptoms disappeared. Following the resumption of benzedrine therapy the loss in weight continued, and in the final 6 weeks she lost 8 lb. During 2 of these weeks she again missed an appointment and was without benzedrine for 2 weeks. Upon cessation of the benzedrine her appetite became "tremendous," and she ate so much that there was a temporary gain in weight. At her last visit she stated that she felt perfectly well, and physical examination disclosed no abnormality. She lost 29 lb during the 17 weeks of observation.

Case 2 (obesity with psychoneurosis). A housewife of 32 complained of being overweight and of weakness, easy fatigability and tiredness. She had always been overweight, but since her marriage 8 years previously her weight had increased from 165 to 212 lb without apparent cause. Her appetite had always been very good, and she ate a great deal between meals. She had had weakness and easy fatigability for the past year. Six and a half years previously, following the birth of her first child, she had had a nervous breakdown. During that period she lost 35 lb, so that her weight dropped to 140 lb. Since then her weight had increased to its present figure. The cause of the breakdown was not known to her. She said that at that time, "I could not eat. I could not look at food. I had terrible and crazy thoughts, nothing interested me. I did not care for anything."

I had frequent ideas of falling. She was ill for about a year with this condition, and then gradually improved. She had always slept well but awoke every morning with a tired feeling and without a normal sensation of restfulness. During the day her fatigue occurred without relation to exertion. The rest of the history was irrelevant.

The height was 61 in. and the weight 210 lb (87 lb overweight). The patient showed a centripetal obesity, the fat being chiefly over the buttocks, thighs, abdomen and upper arms. The hands and feet were small and in proportion to the height. The blood pressure was 120/80. The rest of the examination was normal. The hemoglobin was 60 per cent (Sahli) with 4,100,000 red blood cells per cu mm. The blood smear showed moderate hypochromia of the red cells, but no abnormalities of the white cells. A sugar-tolerance test, following the ingestion of 100 gm. of dextrose in 20 per cent solution, showed no glycosuria up to 2 hours. The blood sugar at the end of the 2nd hour was 72 mg per cent (Folin-Wu method).

This patient was placed on the standard low-calorie diet and was given benzedrine sulfate, 7.5 mg on arising, 5 mg at noon and 5 mg at 5 p. m. This was gradually increased to 10 mg on rising, 10 mg at noon and 7.5 mg at 5 p. m. The patient was observed at weekly intervals for 15 weeks,

ing of the acuity of the sensations, weak will and a pleasure-seeking outlook upon life"

To attack the syndrome of anhedonic obesity through the psychologic mechanisms involved, in an effort to cut down the unphysiologic desire for food, seems more rational than the usual therapeutic efforts, which are largely aimed at increasing the metabolism through drug administration—for example, thyroid extract or dinitrophenol—or exercise, or decreasing the food intake by strenuous dieting. The latter methods are successful, but do nothing to eliminate the cause, that is, the anhedonia. This neurotic relation is shown by the easy fatigability of the obese, which is, we believe, due not so much to the excessive weight that must be carried as to the neurotic factors which have produced and are sustaining the obese state. This is well attested by the fact that in many of the cases to be described the fatigue was not that seen after physical effort, unusual or customary, as in normal persons, but was the characteristic "morning tiredness," occurring even without the expenditure of energy, which is seen in the neurotic and the physically sick. Thus, the excess food ingestion of the anhedonic obese person rarely occurs in the morning, when desire and mood are especially low, but comes later in the day and in the evening.

Benzedrine sulfate (phenylisopropylamine) is an advantageous drug with which to attack the problem. Its action is primarily that of a sympathetic stimulant, chemically speaking, it is an adrenergic drug. Thus, on the eye and the vascular system it has the classic effects of sympathetic stimulation, it relaxes the spasm of the gastrointestinal tract,⁸ and tends to decrease the gastric juice while increasing its acidity.⁹ Its effects on the mood, on the sensation of energy and its output, and on the gastrointestinal tract offered the desired psychophysiologic action. Given in small doses, below the point where it produces marked changes in the visceral activities, benzedrine sulfate prevents sleepiness and drowsiness, this is the basis for its use in narcolepsy.¹⁰ The dissipation of the feeling of fatigue and the beneficial influence on state of mind effected by this drug in both normal and neurotic persons have been established by recent reports.^{11 12 13} Because of these psychologic effects the urge to eat as a means of filling out an empty existence is lessened.

The direct effect of benzedrine sulfate on the appetite for food is of primary importance in the group of cases to be discussed. That it seems to cause a loss in weight has already been noted by Nathanson.¹² Evidence of its ability to reduce the appetite will be adduced below.

A group of 17 unselected and consecutive private patients, with a primary complaint of obesity, were placed after initial study on a measured, unweighed diet of about 1400 calories, with an approximate composition of protein 69 gm., fat 57 gm., carbohydrate 150 gm., calcium 0.65 gm. and iron 0.014 gm. No further instructions as to the diet were given after the first visit. No patient was urged to follow the diet, or to do otherwise than obey his natural desire. All patients were observed at intervals of from seven to fourteen days, and at each visit the weight, blood pressure and pulse rate were observed. All reported symptoms were noted, and leading questions which might obscure the subjective effect of the drug were avoided. Prolonged observation by Myerson and his associates¹⁴ indicated that in man the elevation of the blood pressure was the most toxic effect of benzedrine. This hypertensive effect was rarely associated with an increase in the pulse rate. The dosage of benzedrine utilized never caused blood-pressure elevation, even in patients with hypertension. Subjectively, the more important criteria of benzedrine toxicity were nervousness, a jittery sensation and nocturnal insomnia. Here again, careful regulation of the dosage prevented these reactions.

Benzedrine sulfate is distributed in 10-mg tablets, which are scored so that they may be broken into quarters, each representing 2.5 mg. The most satisfactory plan of treatment was to give three doses daily—a large dose in the morning immediately on waking or rising, a moderate dose at noon and a small or moderate dose in the late afternoon. As a rule, we started with 7.5 mg on arising, 5 mg at noon, and 2.5 mg at 5 p.m. This dosage was gradually increased from week to week as the need arose, but the dosage was stopped well short of the point at which nervousness or nocturnal insomnia was produced. Ordinarily, an increase of 5 mg weekly caused no untoward symptoms. The largest dose given any patient was 30 mg daily, divided into three unequal doses (12.5 mg on arising, 10 mg at noon and 7.5 mg at 5 p.m.).

This dosage schedule accomplished two desirable results: the largest dose was given in the morning, when the feeling of the energy was at its lowest, and the smallest was given in the afternoon, when the energy output was increasing and the time for sleep was approaching. In occasional cases, where the appetite for excess ingestion of food during the evening was uncontrollable, the plan of giving a large dose in the morning, a small dose at noon, and a moderate or large dose at 5 p.m. was tried with some success, particularly if insomnia did not follow. All patients were supplied with only enough tablets to last until the next

overweight) Except for generalized obesity, the examination was negative. The blood pressure was 126/84. The urine showed no albumin, sugar or abnormalities of sediment. The hemoglobin was 70 per cent (Sahli), the red blood cells numbered 4,000,000 per cu mm, and the smear showed normal red and white blood cells.

This patient was placed on the standard low-calorie diet. She was given a mild hypnotic (sodium bromide) to aid her in securing sound sleep, and a fairly large dose of benzedrine in the morning immediately on rising in order to break up the habit of returning to sleep. On this regimen she showed a weight loss of 32 lb in 21 weeks. The blood pressure ranged from 140/90 to 106/76, tending to drop during observation. During the course of treatment she found it very easy to follow the diet. Moreover, the morning benzedrine tablet eliminated the desire to go back to bed at that time. She had no difficulty in falling asleep at night, and after a few nights omitted the hypnotic entirely. Her feeling of energy was markedly increased, and her appetite was noticeably less. She became slightly constipated. There were no untoward symptoms, except occasional headaches, which were no more frequent than those she had occasionally had before taking the benzedrine, and were of the same nature. Toward the end of the period of study the patient developed an increase in appetite during the evening. To counteract this, the benzedrine medication was rearranged so that she took 5 mg on rising, 2.5 mg at noon and 7.5 mg at 5 p m. This rearrangement did not seriously interfere with sleep, and it helped in decreasing the excessive evening appetite. During a 2 weeks period the patient was given placebo tablets and gained 4 lb. She noted a return of sleep spells and marked increase in appetite.

Case 9 (obesity following subtotal thyroidectomy) A houseworker of 38 complained of being overweight. Two years before her first visit she had had a subtotal thyroidectomy for hyperthyroidism, from which she had completely recovered. In the 2 years following the operation she had gained 35 lb, mostly in the 1st year. The rest of the history was irrelevant.

The height was 61 in. and the weight 150 lb (27 lb overweight). There was generalized obesity. The eyes were prominent but showed no lid lag. The skin over the elbows and over the posterior surfaces of the upper arms was somewhat dry and rough. The hair was slightly coarse. The neck showed a well healed thyroidectomy scar, with a small amount of thyroid tissue palpable in both lobes. There was slight puffiness under the eyelids. The urine was free of albumin, sugar and abnormalities of the sediment. The hemoglobin was 78 per cent (Sahli), the red-blood-cell count was 4,650,000, the smear was normal, the basal metabolic rate was -3 per cent (Mayo standards) in a satisfactory test. The blood pressure was 110/80.

There was an apparent disturbance in the appetite-regulating mechanism, as evidenced by a constant craving for food. There was no clear-cut clinical evidence of myxedema, and the basal metabolic rate bore out this negative impression. She was therefore placed on the standard low-calorie diet and was given benzedrine sulfate, 5 mg on rising, 5 mg at noon and 2.5 mg at 5 p m. This dosage was gradually increased until she was receiving 10 mg on rising, 7.5 mg at noon and 5 mg at 5 p m. Her highest blood-pressure reading during the course of treatment was 126/84. The pulse rate was always within normal limits. She was seen at biweekly intervals during the next 19 weeks, during which time she lost 27 lb. There were no untoward symptoms throughout the course of observation. Her sleep was not interfered with and she found it very easy to follow the diet. Her appetite

was good, but she lost the craving for food. She was discharged after 19 weeks of treatment because she had attained her normal weight. The final physical examination showed no abnormalities.

Case 10 (obesity) A housewife of 45 complained of being overweight and of easy fatigability. She had been overweight all her life. Twenty years previously, at the time of her marriage, she weighed 170 lb. Her appetite had always been unusually good. She had dieted many times but without any success, and in fact within the preceding months had gained 5 lb. The rest of the past, marital and family histories was irrelevant.

The height was 65 in. and the weight 231 lb (95 lb overweight). There was generalized distribution of the excess fat except for the breasts, which were normal in size. The blood pressure was 152/78. The heart was not enlarged, but a barely audible systolic murmur was heard over the apex. The rest of the examination was normal. The urine was free of albumin, sugar and abnormalities of sediment.

The patient was placed on the standard low-calorie diet and was given benzedrine, 5 mg on rising, 2.5 mg in mid morning and 2.5 mg at noon. This dosage was gradually increased and the time of administration was rearranged, so that eventually she was taking 12.5 mg on rising, 10 mg at noon and 5 mg at 5 p m. She was seen at intervals of 10 days over a period of 25 weeks, and during that time lost 48 lb. The initial blood pressure, which was somewhat elevated, showed a normal reading on subsequent visits, and on several occasions went as low as 104/70. During the period of observation she noted a decreased appetite and an increased feeling of energy. There were no other subjective changes. She found it easy to follow the diet. For several weeks the rate of loss in weight was so marked that the diet had to be increased. At no time was there interference with the ability to fall asleep or stay asleep. During one 10-day interval, blank placebo tablets were substituted for the benzedrine sulfate. The patient gained weight in that period and noted a marked return of appetite and "extreme hunger."

Case 12 (obesity—failure of benzedrine to aid in reducing weight) This patient, a student of 20, had been under intermittent observation for a period of 3 years. She had undergone a previous course of reducing with diet and thyroid extract quite satisfactorily, attaining a final weight of 135 lb., 2½ years before the present period of study. In the interim she had gradually gained weight to a maximum of 177 lb. This gain occurred while she was working as a cook.

The height was 63 in. and the weight 176 lb (48 lb overweight). Examination showed centripetal obesity, the excess adiposity being largely confined to the middle third of the body, and most marked over the buttocks and upper thighs. The breasts were small and pubescent. The hair distribution was normal. The rest of the examination was normal. The basal metabolic rate in two determinations was ± 0 per cent (Mayo standards). The blood pressure was 94/60.

The patient was placed on the standard low-calorie diet and was given benzedrine sulfate, 7.5 mg on rising, 5 mg at noon and 2.5 mg at 5 p m. The dosage was gradually increased to 10 mg on rising, 7.5 mg at noon and 5 mg at 5 p m. Over a period of 10 weeks there was no change in weight. Numerous unpleasant symptoms were complained of— inability to breathe deeply, marked nervousness, constipation, dry cough, increased irritability with difficulty in falling asleep and marked fatigue. Further study of the emotional background dis-

during which time she lost 17 lb. Her fatigue disappeared, although her sense of well being was not particularly improved. There was a significant decrease in the appetite. The blood pressure remained within normal limits. This patient is still under observation.

Case 3 (obesity with psychoneurosis) A housewife of 38 complained of being overweight and of nervousness. She had been overweight most of her life. Seventeen years previously, at the time of her marriage, she had weighed 140 lb, and since then had gradually gained in weight. One year previously she had undergone a tonsillectomy, and had gained 15 lb shortly thereafter. Her appetite had always been excellent, but she was not accustomed to eating between meals. She stated that she had always done her own cooking and did do a good deal of tasting. Recently she had become accustomed to sleeping 10 or 11 hours at night. She had been nervous and easily irritable since her husband had been diagnosed as having heart trouble. Her father had died of Bright's disease at the age of 52, and one brother had diabetes and heart trouble. The rest of the history was negative.

The height was 64 in. and the weight 194 lb (62 lb overweight). Except for generalized obesity, the physical examination was negative. The blood pressure was 126/80. The urine was free of albumin, sugar and abnormalities of the sediment. The hemoglobin was 78 per cent (Sahli). The basal metabolic rate in a satisfactory test was -15 per cent (Mayo standards).

The patient was placed on the standard low-calorie diet and given benzedrine sulfate, 2.5 mg on rising, 2.5 mg in mid morning and 2.5 mg at noon. The dosage was gradually increased until she was taking 10 mg on rising, 7.5 mg at noon and 5 mg at 5 p m. This patient was seen at weekly intervals for a period of 23 weeks and in that time lost 26 lb. The craving for food was lost, the nervousness and irritability became markedly decreased. She slept well, was free of all unpleasant subjective symptoms and in fact had a sense of well being. Benzedrine was omitted and placebo tablets were given for 2 weeks during the period of observation, during that time, she spontaneously stated, she had had a return of her nervousness and craving for food. During this period there was a gain in weight of 2 lb.

Case 7 (obesity with narcolepsy) A 34-year-old salesman complained of being overweight and of sleepiness. His birth weight was 16 lb and he had been continuously overweight since birth. At the age of 16 he weighed 140 lb, at the age of 19, 200 lb. His weight gradually increased until at the age of 29 he weighed over 300 lb. The weight had been stationary for the last 4 years. His appetite had always been very good, and he ate continuously throughout the day. In addition to sleeping 9 or 10 hours at night, he found himself continually falling off to sleep throughout the day whenever the opportunity presented itself. In the past history there was nothing of importance except that he had had gonorrhea 18 years before, which had apparently never cleared up, as since then he had noted a slight penile discharge intermittently. He had also had nocturia during the last 7 or 8 years, but apparently no daytime frequency or polyuria. There was no impairment of sexual desire or potency.

The height was 69 in. and the weight 316 lb (158 lb overweight). The blood pressure was 104/80. The patient was very obese, with the excess adiposity concentrated about the abdomen. There were a few red striae over the lower abdomen. The fundi showed clear and well-outlined nerve heads, normal arteries and slightly engorged veins. The mouth, throat, neck, heart and

lungs were normal. The genitalia were normal. All reflexes were normal. The urine had no albumin or sugar, but the sediment showed 10 white blood cells per high-power field, and the stained urinary sediment showed many extracellular cocci. The prostatic smear showed many pus cells and cocci. The basal metabolic rate was +8 and +10 per cent (Mayo standards) in two fairly satisfactory determinations. The blood Hinton test was negative. Blood sugars taken 1 and 2 hours after the ingestion of 100 gm. of dextrose in 20 per cent solution showed values of 174 mg per cent and 95 mg per cent respectively. A 24 hour urine was measured to exclude the possibility of diabetes insipidus and showed a volume of 3000 cc.

This patient presented two clinical problems: lethargy, almost to the point of narcolepsy, and a huge appetite, present since birth. He was placed on the standard low-calorie diet and given benzedrine sulfate, 10 mg on rising, 10 mg at noon and 5 mg at 4 p m. This dosage was later changed to 12.5 mg on rising, 10 mg at noon and 7.5 mg at 5 p m. He was seen at weekly intervals for the next 12½ weeks, during which period he lost 54 lb. He followed the diet with ease, and stated voluntarily that his appetite was markedly decreased, and that he had become more active physically and felt very well. His daytime drowsiness disappeared, although he continued to sleep well at night. No unusual symptoms presented themselves, except for slight constipation. He stated that he was seldom hungry and was satisfied with the amount of food allowed in the diet. For 1 week during the period of observation he did not take the benzedrine tablets, and during that period there was no loss in weight and the narcolepsy returned. Upon resumption of the benzedrine tablets the drowsiness disappeared and the loss in weight continued. Later on the patient stopped all treatment for 1 month and regained 11 lb in that time. Upon resumption of benzedrine the loss in weight continued as before.

Case 8 (obesity with hypomenorrhea) A housewife of 27 complained of being overweight and of irregular menstruation, shortness of breath, backache and nervousness. In the 6 months preceding her first visit she had gained 40 lb. For many years before that her weight had been constant. She did not know the cause of her gain in weight, and felt sure it was not due to overeating or any change in activity. Careful inquiry disclosed one significant change in her daily habits which was a factor. Shortly before the onset of her gain in weight, her 5-year old son had started to attend school. Whereas previously, having once risen in the morning she was accustomed to staying up, she had now developed the habit of going back to bed for several hours after sending her son to school. Since her regular sleeping habits had not changed in any way, this gave her several hours more of rest every day. She had always been a light sleeper, accustomed to going to bed late and rising early because of her children.

During the period of gain in weight, her menses, which had previously occurred at 28-day intervals, came from 1 to 3 weeks late and were of short duration, with a more scanty and painful flow. During that time she had also noted some low back pain, usually made worse by prolonged sitting. She had consulted a gynecologist, who found no pelvic abnormality. The shortness of breath was of only a few months' duration and occurred following the gain in weight. Her past history showed that she had been pregnant twice and on each occasion had developed hypertension, which was said to have disappeared at the end of the pregnancy.

The height was 65 in. and the weight 189 lb (53 lb

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24031

PRESENTATION OF CASE

A sixty-four-year-old, white, married Swedish gardener entered the hospital with a complaint of jaundice of two months' duration.

He had always been well until two months before entry, when he noticed gradually increasing jaundice of his skin, unaccompanied by pain, chills or gastrointestinal symptoms. As the jaundice became deeper, he noticed that he bruised easily. He developed severe pruritus which caused him to scratch his skin, producing many excoriations. Six weeks before entry he noticed that his stools were slightly paler than normal, and by the time he entered the hospital they were clay colored. During this time his urine became mahogany colored. During the three days before entry he had passed small amounts of bright-red blood in his stools but previously he had had a barium enema. He had had no other symptoms of any kind except anorexia and loss of 25 lb in weight.

During all his adult life he had drunk alcoholic beverages daily. He had taken very little during prohibition, but after that for the four years before entry he had had two or three beers and one whiskey eggnog every day. His past history was otherwise negative. He denied ever having had syphilis.

His wife and two children were living and well, and there had been no miscarriages.

Physical examination revealed a well-developed, fairly well-nourished deeply jaundiced man. He was in excellent spirits and felt well except for severe pruritus. There were numerous small excoriations distributed over practically the entire body. The heart and lungs were negative, and the blood pressure was 125 systolic, 85 diastolic. The liver edge was easily palpable three fingerbreadths below the costal margin and was smooth and non-tender. There was no tenderness anywhere in the abdomen, and no masses were palpable. The spleen could not be felt. There were a few shotty non-tender lymph nodes in the inguinal regions. There were a few external hemorrhoids, and the prostate was normal.

The temperature was 98°F., the pulse 70. The respirations were 20.

The urine had a specific gravity of 1.013, con-

tained the slightest possible trace of albumin and 4+ bile and showed 2 red cells and occasional white cells per high-power field in the sediment. The blood showed a red cell count of 3,880,000 with 60 per cent hemoglobin. The white cell count was 7100, 73 per cent polymorphonuclears. The bleeding time was one and a half minutes. The clotting time varied from fifteen to twenty-one minutes, and there was very little clot retraction. The stool was guaiac negative on two occasions. A van den Bergh was 38.2 mg per cent, biphasic. A blood Hinton test was negative once and doubtful once, and the Wassermann was negative. A Takata-Ara test was negative.

A gastrointestinal x-ray series showed small indefinite filling defects of the esophagus suggestive but not characteristic of varices. The stomach and duodenum appeared normal. The shadow of the liver was moderately enlarged, but there was no evidence of enlargement of the spleen. An x-ray of the chest showed no evidence of metastatic malignancy, but there were two or three indefinite areas of density at the right border of the heart which could have been enlarged glands. Many calcified nodes were present.

On the seventh day duodenal drainage was attempted. An x-ray showed the tip of the catheter apparently lying in the antrum of the stomach. The material aspirated gave a positive test for bile and a questionably positive guaiac test. Soon afterward the tube was passed successfully into the duodenum and bile-stained material was aspirated. The sediment from this specimen contained 4 or 5 red cells per high-power field, and occasional white cells, some in clumps. On the following day the duodenal contents were bile negative, and the blood van den Bergh was reported as 57 mg per cent, biphasic. About that time he complained of pain in the left shoulder, and examination revealed a tender mass measuring 2.5 by 3 cm in diameter just medial to the scapula. By the eleventh day this mass had increased in size to a diameter of about 8 cm and was sufficiently painful to interfere with his sleep. It was not red or fluctuant. On the following day he had a moderate nosebleed and some bleeding from an excoriation on the back of his neck. The bleeding time was two minutes and the clotting time varied from fifteen to thirty-one minutes. The clot retraction was normal. The white-cell count of the blood was 12,800, with 68 per cent polymorphonuclears, but his temperature remained normal. A laparotomy was performed on the fourteenth day after two pre-operative transfusions.

DIFFERENTIAL DIAGNOSIS

DR. MARSHALL K. BARTLETT: Our problem in this case concerns a man of sixty-four who has

closed that just before coming under observation the patient had gone through an unhappy love affair, which had left her quite depressed. She stated that during her periods of greatest depression she ate large amounts of food in an effort to compensate for her disturbed emotional state. The benzedrine in this instance had of course failed to restore the feeling of well-being and of increased energy, which is often essential to its action in reducing the appetite. Appropriate psychotherapy in this patient eventually restored some degree of emotional calm, and the administration of benzedrine during this phase effected moderate loss in weight without unpleasant symptoms.

Benzedrine sulfate is an important aid in the treatment of obesity of any type, on the one hand it decreases the appetite, and on the other so increases the sense of well-being and of energy that physical activity is spontaneously increased. Its proper place in the treatment of obesity is as an adjuvant. In association with a properly selected low-caloric diet, it helps the patient to follow the diet with greater ease by abolishing the neurotic and ill-timed craving for foods which plays so important a role in the genesis and maintenance of the obesity. Our experience, however, shows that benzedrine will not so readily effect weight reduction when it does not lift the patient's mood and increase his sense of well-being. In the more profound neuroses where elevation of mood is not in any permanent way affected by the drug and where the appetite is already absent, benzedrine sulfate is not indicated. Its use in the neurotic obese, therefore, is largely limited to those cases associated with what we have here termed a mild anhedonic state.

SUMMARY AND CONCLUSIONS

1 Obesity is often due to a defect in the mood which upsets the appetite-regulating mechanism. In such cases increased eating, which does not represent true hunger, takes place in order to offset and compensate for the disturbed mood.

2 The commonest cause of this disturbance in appetite is the anhedonia associated with psychoneurosis.

3 Benzedrine sulfate, by improving the anhedonic state, acts as an aid in obese neurotic persons.

4 Benzedrine sulfate has a direct effect in depressing the appetite and in increasing physical activity, and is therefore useful in any type of obesity.

5 In a group of obese patients suffering from associated psychoneuroses, endocrine disease and narcolepsy, benzedrine sulfate has been used as an adjuvant to weight reduction without development of any toxic signs or symptoms, during periods ranging from six to twenty-five weeks.

At the time of going to press benzedrine sulfate has been used in the treatment of 40 obese patients over periods of from three to nine months. The above conclusions are substantiated with regard to benefit and lack of toxicity in the indicated dosage.

371 Commonwealth Avenue.

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PATHOLOGICAL DISCUSSION

DR. MALLORY The autopsy showed a very large liver. It was very pale green at autopsy, and as I understand it, it was a dark green at the time of operation.

DR. CROVE Yes, it was.

DR. MALLORY That would be a very unusual finding for toxic hepatitis. One almost always finds yellow jaundice of the liver rather than green jaundice with an acute intrahepatic lesion. That certainly is true at autopsy and I believe it is at operation. Would you agree, Dr. Allen?

DR. ARTHUR W. ALLEN Yes.

DR. MALLORY The common bile duct, the cystic duct and the gall bladder proved to be entirely negative. When we reached the point where the two hepatic ducts join we could feel some slightly firm tissue practically in the hilus of the liver. In gross opinion in the laboratory was divided as to whether it was an inflammatory stricture or a neoplasm. On the whole most of us after palpating the lesion favored inflammatory stricture, but that would be quite extraordinary in a patient who had never been operated on and who had had no evidence of gallstones. Microscopic examination showed primary carcinoma of the bile ducts evidently arising at the juncture of the two hepatic ducts so high up that any form of anastomosis would have been impossible.

A PHYSICIAN Did you look at his shoulder?

DR. MALLORY We did not turn the body over.

DR. RICHARD B. KING In what proportion of cases of carcinoma of the pancreas can you feel a mass?

DR. MALLORY I should guess that two thirds of the time you might feel one.

DR. CROVE Could the blood in the duodenal content have come from this tumor?

DR. MALLORY It certainly could have. I think one has to be very cautious, however, in interpreting small amounts of blood in the gastrointestinal tract of a jaundiced patient. Many of them bleed all up and down the gastrointestinal tract, without gross lesions.

CASE 24032

PRESENTATION OF CASE

A forty-eight-year-old Swedish laundryman was admitted complaining of weakness and numbness of the legs. During the two years preceding entry the patient had noticed occasional stiffness and weakness in the neck. During the same time there was slightly increasing fatigue. He recalled some difficulty in getting about in the dark because of easy loss of sense of direction. About a year before entry he began to have spells of faint-

ness although he did not lose consciousness. Six months before entry he began to have numbness of the calves, feet and posterior thighs, particularly on the right. There were also some numbness and weakness of the forearms, more on the left. Shortly afterward he had numbness and loss of taste on the left side of the tongue, although he was still able to smell with the left nostril. Three months before entry he developed morning nausea and vomiting. He attributed this to beer which he apparently had been drinking in large quantities. He discontinued the beer drinking, but the nausea and vomiting persisted. Four weeks before coming to the hospital his wife noticed asymmetry of his face due to weakness of the left side, and at this time his legs became weaker, so that he had to be very careful about walking. His neck became weaker, and his head felt heavier. He complained of blurring of vision in both eyes, although a physician told him that his eyes were normal. The patient had also noted headache, dizziness and nervousness. Weakness in the left leg caused him to stagger, particularly to the left.

At the age of six months it was noted that his left shoulder was paralyzed. Twenty years before entry he developed deafness in the left ear which was associated with hissing noises. The deafness increased until it became complete. The tinnitus disappeared several years ago.

Physical examination showed a rather thin man in no acute discomfort. The muscles of the left shoulder cradle and the deltoid and biceps were atrophied in appearance. The left upper chest was more prominent than the right. There was left fifth-nerve weakness with sensory loss on the left side of the face, skin, mucous membranes and tongue. The left corneal reflex was absent, and there was left nerve deafness. There was facial asymmetry with questionable drawing up of the muscles of the left cheek. The strength of the arms and legs appeared to be normal and equal on both sides except for evidence of old left brachial palsy. The finger-to-nose and the heel-to-knee test showed evidence of asynergia on the left side. Position sense was preserved. There was hypoalgnesia of the right arm. The pupils reacted normally to light. The triceps, biceps and radial reflexes were absent. The abdominals were present but diminished. The knee jerks were normal and symmetrical. Cremasteric reflexes were absent. The ankle jerk was present on the right, absent on the left. Plantar stimulation showed dorsiflexion of the great toe bilaterally. Caloric tests failed to elicit nystagmus on the left. There was absence of taste perception on the left side of the tongue.

The temperature, pulse and respirations were normal.

painless jaundice of two months' duration, which has steadily progressed apparently without definite fluctuation in the degree of jaundice. It seems to me that the first thing to try to decide is whether the jaundice was due to obstruction of the common duct or to an intrahepatic process of some kind. I think we can rule out syphilis on the basis of his negative blood Hinton and Wassermann tests and the absence of anything suggestive in the history.

In regard to cirrhosis of the liver, it seems to me that the only things in this case that particularly favor such a diagnosis, are the facts that he is a man with a history of prolonged alcoholic intake and that there were questionable esophageal varices by x-ray. Against cirrhosis are the short duration of the disease, its relatively rapid progress and a lack of any preceding gastrointestinal story of any kind. The spleen was not palpable, and he had no ascites that could be made out clinically, also, the jaundice was very deep and had progressed quite rapidly. So we have to assume that this man had an obstructive jaundice, and we must try to decide where the obstruction was and what caused it. For practical purposes we must differentiate gallstones and malignant neoplasm. I cannot see anything in this story in favor of gallstones except the fact that it is a more common disease than neoplasm with obstruction to the common bile duct. He has no past history suggesting gall-bladder disease. He has had no pain at any time. The jaundice has been steadily progressive from the onset until his admission, at which time he apparently had nearly complete obstruction of the common duct. Again favoring neoplasm is his rather great and rapid weight loss, 25 lb. in two months. It seems to me, then, that we have to say that the chances are overwhelmingly in favor of a malignant obstruction rather than a gallstone, although I think we cannot get around the possibility that a gallstone can do all these things. It is not so likely as neoplasm.

The best possibility is carcinoma of the head of the pancreas. What of a neoplasm involving primarily the bile duct and possibly the gall bladder? It is perfectly possible but less common. The various bleeding phenomena are perfectly explainable on the basis of jaundice. I do not feel very happy about that mass on his back, medial to the scapula, which appeared toward the end. The rapid increase in size is striking. When it was first noticed it was 3 cm. in diameter and on the eleventh day it was 8 cm., and painful. It seems to me too rapid an increase in size for a metastasis, and it must be, I suppose, an infected hematoma. So my diagnosis in this case is carcinoma of the head of the pancreas with obstruction of the common duct

with resulting jaundice and various bleeding phenomena.

DR NEIL L. CRONE: We felt more or less the way Dr Bartlett did. One thing I should like to say that might have made it easier is that the mass over the scapula at first was non-fluctuant, but as it increased in size, it became definitely fluctuant. It did not involve the skin and was never red. I shall read the note which I wrote to Dr Linton: "I believe that this man should be explored. I feel that he has carcinoma of the pancreas or bile ducts (probably the latter). I admit that cirrhosis is possible, but such a diagnosis cannot be made. Regardless of this possibility I believe exploration should be done."

The red cells in the duodenal drainage partially influenced me toward the possibility of cancer of the bile duct, furthermore, I felt that if he had carcinoma of the pancreas which had eroded through the duodenum it certainly ought to show by x-ray.

DR TRACY B. MALLORY: Were you present at the operation? Can you tell us what was found?

DR. CRONE: It is always difficult for a medical man who has not scrubbed to see much. Dr Linton found the liver enlarged and apparently rotated. The gall bladder was not distended, in fact it was quite decompressed, otherwise it appeared normal. The head and body of the pancreas were normal. The common duct was not distended, it was collapsed. No obstruction could be found. There were no stones in the gall bladder or common duct. Our impression of the liver was that it presented the appearance of acute hepatitis.

The patient died three days later without any further developments that seemed significant from the point of view of diagnosis.

CLINICAL DIAGNOSES (PREOPERATIVE)

Obstructive jaundice
Carcinoma of the head of the pancreas or of the bile ducts?
Common duct stone?

DR. BARTLETT'S DIAGNOSES

Obstructive jaundice
Carcinoma of the head of the pancreas
Hematoma of the back

ANATOMIC DIAGNOSES

Carcinoma of the extrahepatic bile ducts
Operation wound exploratory laparotomy
Hemorrhage, postoperative
Hydrohepatosis
Purpura
Hydrothorax, bilateral
Icterus

These tumors when they come to operation have a fairly uniform appearance. They are 4 cm or so in length and about 3 cm in diameter, and lie wedged against the side of the pons between the cerebellum and the posterior surface of the petrous pyramid. In all the cases which I have examined post mortem there has been extensive erosion of bone in the region of the internal acoustic meatus, with tumor extending into the inner ear. This erosion, it seems to me, has always been more extensive than it appeared in the x-ray films.

The fact that impairment of hearing and tinnitus have usually been present for several years before the onset of other symptoms may very well mean that the tumor starts near the labyrinth and extends into it long before it reaches any great size. That the deafness in this case, of twenty years' duration, was due to the tumor is,

I believe, not at all impossible. The tinnitus eventually stopped, probably owing to destruction of the labyrinth or nerve.

Curiously enough the seventh nerve, which also passes through the internal meatus, is seldom completely paralyzed and may be affected only slightly. Sensory impairment on the face, usually present when the patient is seen by a neurologist, may be accounted for by the fact that the fifth nerve is stretched over the inner anterior pole of the tumor and its inner portion is compressed between the tumor and the pons. Then, too, there is pressure against the pons which may very well affect the fifth-nerve nucleus.

The so-called cerebellar signs probably result largely from pressure on the vestibular nucleus although pressure on the cerebellum is another possible factor.

Examination of the urine showed a specific gravity of 1.020, with a slight trace of albumin. The sediment was negative. The blood gave a red cell count of 4,300,000 with a hemoglobin of 75 per cent. The white cell count was 8400, 64 per cent polymorphonuclears. A lumbar puncture done before the patient's admission to this hospital is reported to have shown a clear colorless fluid, the pressure and total protein were not recorded. A test for globulin gave a 4+ reaction. The cell count was 2 per cu mm. The spinal-fluid Wassermann test was negative. A blood Hinton test was negative.

X-rays of the skull showed definite enlargement of the left internal auditory canal. The canal was expanded throughout its entire length, the greatest enlargement being near the tip. There was no definite enlargement of the sella turcica. The clinoids were rather indistinct but showed no definite evidence of erosion.

During the succeeding week the patient showed no essential change in his condition. A craniotomy was performed on the eleventh hospital day.

DIFFERENTIAL DIAGNOSIS

DR. AUGUSTUS S. ROSE: If possible one would like to make a diagnosis of a single disease process. In this case, however, we are confronted with a process or processes which are sufficiently widespread to involve the central and peripheral nervous systems. There are very few such conditions.

The history, through symptoms of weakness and sensory disturbances, directs our attention at first to the peripheral nerves, but the physical examination shows signs of central involvement. The gradual onset of deafness with tinnitus, leading finally to complete nerve deafness, and followed by the loss of taste on the left side of the tongue and by loss of sensation on the left side of the face, with also the development of a facial asymmetry (presumably a left facial weakness), points strongly to a slowly growing tumor at the left pontine angle. The examination substantiated the history that there was loss of function of the left eighth, seventh and fifth nerves (although weakness of the face is not definitely stated). The suspicion of tumor is confirmed by the x-ray finding of enlargement of the internal auditory canal. With slow development and progression, the most likely tumor in this location is a neurofibroma, probably starting in the eighth nerve. If it is a single tumor involving all three nerves, then it is sufficiently large to explain the Babinski signs, headache, dizziness and vomiting. Involvement of the vestibular division of the eighth nerve would explain staggering to the left. Other lesions are necessary, however, to explain the subjective symptoms

(not substantiated by examination) of weakness of the neck and extremities, sensory disturbances in the arms and legs, and absent tendon jerks. These are symptoms and signs associated with disease of peripheral nerves, especially when the jerks are absent on one side and present on the other. We are not informed as to the presence or absence of a palpable tumor in the skin or along the nerve trunks, or of pigmented spots on the skin, but neurofibromas are frequently multiple, and we wonder about von Recklinghausen's disease. Yet, we are led to believe that this patient drank beer to excess, and there is no reason why a person with an acoustic neuroma should not also develop a peripheral neuritis. No information is given, however, as to the patient's diet, and these symptoms have lasted at least two years. With peripheral neuritis of two years' duration, more objective motor disturbances, such as atrophy and profound weakness of certain muscle groups, would be expected. Neurofibromas produce symptoms only by compression, and when situated on peripheral nerves must attain considerable size before much degeneration of neurons occurs. Furthermore, it is difficult to conceive of tumors on the nerves causing disappearance of tendon jerks without other signs.

The laboratory data give only negative evidence. Without more information the diagnosis must remain: (1) left pontine angle tumor, probably an acoustic neuroma, (2) neurofibromatosis (?), (3) peripheral neuritis of unknown cause (?) and (4) old left brachial-plexus injury.

PREOPERATIVE DIAGNOSIS

Left acoustic neuroma

DR. ROSE'S DIAGNOSES

Left pontine angle tumor, probably an acoustic neuroma
Neurofibromatosis?
Peripheral neuritis of unknown cause?
Old left brachial-plexus injury

ANATOMIC DIAGNOSIS

Acoustic neuroma

PATHOLOGICAL DISCUSSION

DR. CHARLES S. KUBIK: Dr. Rose did well to concentrate on the evidence pointing to a tumor of the pontocerebellar angle. Operation disclosed an encapsulated tumor lying against the left side of the pons anterior to the cerebellum. Microscopic examination of the part removed showed it to be a neurofibroma. Considering the location one may be certain that it was a tumor of the acoustic nerve.

This establishes the check-off scheme sometimes employed to hinder defections from the ranks of organizations that fear difficulty in maintaining membership and to impose on the employer the burden that properly belongs to the organization of providing a collection agency. Under the check-off system, a member who finds membership no longer advantageous cannot quietly and without explanation cause his membership to be terminated by the simple expedient of omitting payment of dues. He must take affirmative action and resign from the organization, with danger of loss of social standing among his fellows, and he must notify his employer that his membership has been terminated, with the possible loss of esteem by his superior officers if the organization happens to be a pet scheme that they are promoting.

If Group Health Association succeeds in establishing the check-off system as a proper and lawful way of insuring the payment of the present and prospective debts of government employees, it will undoubtedly prove a boon to labor unions, finance corporations, merchants who do business on the instalment plan, landlords and others, who under the law cannot attach or garnishee the salary of an employee of the federal government but who will be able to protect themselves in advance by demanding assignments of federal salaries as securities for debts. If Group Health Association is going to have the check-off system adopted by the federal government for its benefit, there is no reason why any and every other person, whether individual or corporate, may not claim the same privilege.

Such comment is so irrelevant that it can have but little force.

Forgetting the principles relating to sickness insurance adopted by the House of Delegates of the American Medical Association in 1934, the seventh of which states that "medical service must have no connection with any cash benefits," the article comments

The association does not undertake to indemnify its members in cash, which would help the member to provide himself and his dependents, in time of sickness and in time of health, with the necessities of life, including medical service, but to indemnify him only in medical and hospital services,

And then the article resorts to the following extraordinary line of reasoning

Under the scheme proposed by Group Health Association, far greater benefits will accrue to the richer and more liberally paid employees of the Federal Home Loan Bank Board and its affiliates and of such other

government agencies as may identify themselves with the scheme than to employees of more meager resources. The scheme is so planned that the richer and more liberally paid employees are to obtain medical services at rates based on the incomes of the poorest employees. The courts have repeatedly held that the value of medical services rendered to a patient may be properly appraised in relation to his wealth, just as the value of the interests that the lawyer is called on to protect, whether interests involving the life of his client or his client's property. Under the present scheme, fees that are charged for medical services to the richer and more liberally paid employees are to be identical with those charged employees of the lowest grade, doing part time work. The richer and more highly paid and influential employees are therefore to gain the most financially by this scheme. Nothing in the certificate of incorporation or by laws assures to those lower in the ranks that they will receive the same quantity and class of medical service as that provided for their superiors.

And, in another place it is stated

Especially would quality be likely to fail in times of epidemics and of any unusual prevalence of disease, when the limited medical staff of the association would be overworked and could find no relief.

One might comment that the courts do not demand that patients voluntarily pay according to their wealth. Payments under hospital service corporations or any form of insurance policy are not appraised in relation to wealth and are not illegal. There is nothing in the certificate of incorporation that says that those of lower rank will receive poorer service. In times of epidemic it seems likely that the quality of other medical services also would fail.

There appears to be much in the attitude and substance of the article quoted that reflects a prejudice that has interfered with judgment. If the charge of illegality cannot be sustained it is useless. Too many educational and other institutions have indulged in the so-called corporate practice of medicine to make applicability of this point of law likely. The irrelevance of most of the criticism of this attack on a medical scheme which may be viewed critically by many of the profession renders it ineffectual. Had Group Health Association adhered to the principles that have successfully guided hospital service corporations, the relation of doctor to patient and patient to hos-

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GROUP HEALTH ASSOCIATION, INCORPORATED

CRITICISM that reveals hostility or prejudice is often ineffective.

An article prepared by the Bureau of Legal Medicine and Legislation of the American Medical Association in the October 2 issue of the *Journal of the American Medical Association* characterizes Group Health Association, Incorporated, as "unlicensed and unregulated health insurance and corporate practice of medicine" sponsored "morally and through a contract of such a character that neither the Federal Home Loan Bank Board nor Group Health Association is willing to make it public."

The article states

Its certificate of incorporation is a feebly disguised attempt on the part of the organizers to obtain authority for the association, without liability on the part of its members, to treat its members and their dependents, through hired servants and agents of the association, for any and all manner of disease and injury, and its so-called by laws elaborate on that plan. This certainly constitutes the practice of medicine by the association, notwithstanding the fact that the association is not and cannot be licensed so to practice.

If and when Group Health Association begins to practice medicine as proposed in its certificate of incorporation and its by laws, the United States District Attorney and the corporation counsel for the District, in pursuance of the duties of their respective offices that they have sworn to perform, will be bound to take action to enforce the law.

From what has been said it is to be assumed that the attempt of the organizers of Group Health Association to incorporate is ineffective and that the members of the organization constitute only a voluntary association.

In spite of this rather extreme view taken by the representatives of the American Medical Association, Group Health Association opened on October 30. The prospectus states

The aim of this plan is to make available to Federal employees in Washington, and to their families, adequate medical care, both preventive and curative, to provide this care at moderate cost, and to place that cost on a regular, budgetable basis within the means of the group to be served. If Federal employees are typical of the general population with equivalent incomes, many do not now obtain adequate medical care, especially preventive service and care in chronic conditions, while many others incur disastrous debts each year because of sickness costs. The provision of better care should promote health and well being and reduce time lost from work because of illness. The plan should be of benefit not only to the employees and their families, but also to the Government they serve.

The form of application for membership offers the member the option of paying his dues personally or of assigning to the association so much of his salary, the payment to be made by the employer. Thus payment for the service may be made just as payments are made to most hospital service corporations. Apparently the writer in the *Journal of the American Medical Association* forgets the voluntary aspect of membership and choice of payment, for the article states

in the eighth month of gestation, because of the recurrence of painless vaginal bleeding

There was no family history of carcinoma, pulmonary tuberculosis, diabetes or nephritis. As a child, the patient had had measles and mumps. At the age of seven her tonsils and adenoids were removed. Catamenia began at twelve with a regular twenty-eight-day cycle, lasting four days. The last menstrual period began on February 1, 1937.

The antenatal course was uneventful until September 12, 1937, at which time she was admitted in the seventh month of gestation because of painless vaginal bleeding. At this time a suitable blood donor was procured. Sexual congress had immediately preceded the onset of bleeding. During her hospital stay she stained for the first two days only, and was discharged at the end of one week. The impression was that the patient had a placenta previa but because the bleeding had stopped, she was discharged to be observed in the prenatal clinic.

Following this the patient was seen in the prenatal clinic on two occasions. The blood pressure had a tendency to be high, averaging 140 systolic and 85 diastolic. The fetal heart sounds were normal. Examination of the urine revealed no albumin or casts. The total gain in weight amounted to 18 lb.

When admitted to the hospital at 9 a. m., the patient stated that she had flowed very freely early in the morning, but she was staining very moderately when she arrived. She had no abdominal pains or cramps and denied any local trauma. Examination revealed a well-developed and nourished young woman. The temperature was 98.6°F, the pulse 84, and the respirations 20. The pupils reacted to light and accommodation. The teeth were in good repair, and oral hygiene was good. The nasal passages were clear. The tonsils had been cleanly removed. The thyroid was not palpable. The heart was normal in size, the sounds were regular and clear, without murmurs. The blood pressure was 138 systolic and 80 diastolic. The lungs were normal to percussion and auscultation. The fundus of the uterus was seven fingerbreadths above the umbilicus, and the uterus was soft. The fetus was presenting by the vertex. The fetal heart sounds were not heard. Staining continued throughout the morning. At 2 p. m. she began to have mild labor pains at seven- to ten-minute intervals, and the vaginal bleeding increased. At 3 p. m. the mild labor pains continued at five- to seven-minute intervals, with a slow continuous loss of blood. A rectal examination revealed a thick uneffaced cervix, which admitted the width of one and a half fingers. The head was just above the ischial spines. In view of the findings, it was felt that the baby was dead, and

it was deemed advisable to control the bleeding and to hasten delivery from below.

Under nitrous-oxide and oxygen anesthesia, vaginal examination confirmed the rectal findings, and in addition, the edge of the placenta could be felt implanted posteriorly and low down in the lower uterine segment. The membranes were ruptured artificially, a Number 5 Voorhees's bag was inserted, and a 5-lb weight attached to the stem. A sixth of a grain of morphine sulfate was given hypodermically, and the patient was returned to the labor room not bleeding and in good condition. Four hours later the bag was expelled, and a still-born nonmacerated fetus delivered spontaneously immediately afterward. The perineum remained intact, and the secundines were expressed complete five minutes later. The total loss of blood at the delivery did not exceed 300 cc. Examination of the placenta revealed a small adherent blood clot at one margin which was in all probability the part felt low down in the lower segment, but in addition there was an old black adherent circular clot about 7 cm in diameter and 4 cm in depth in the center of the placenta. On removal of this blood clot, the typical depression in the placenta could be seen. This settled the diagnosis, namely a partially separated placenta, and explained the cause of the dead fetus. In addition, the patient had a low implantation of the placenta.

The puerperium was entirely uneventful. The uterus involuted normally. The blood pressure averaged 124 systolic and 80 diastolic. Two specimens of urine showed a trace of albumin, and a third and last specimen was entirely normal. The patient was discharged on the twelfth day in good condition.

Comment. This case from the history of painless bleeding at the onset suggested placenta previa. The soft abdomen also favored this diagnosis. The bleeding in the seventh month, at the time of the patient's first admission to the hospital, was apparently due to a slight separation of the placenta, a blood clot being formed which stopped the bleeding and allowed the pregnancy to continue until the next bleeding episode.

Conservative treatment, as was followed in this case, is indicated when the baby is dead and when there is no evidence of placental apoplexy (Couvelaire uterus).

COLDS AND WHAT TO DO FOR THEM

Most people look on a cold as a nuisance rather than an illness which should be treated. They would not miss work for such a little thing as a cold in the head, still

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pital could have been left almost unchanged, the liabilities incident to payment of physicians' salaries and hospital fees would not have been directly incurred by the association, and the members might have had free choice of physicians and hospitals, and thus the services of all the physicians and all the hospitals of Washington, at their service. With these possibilities at hand the wisdom of the association's actions might well have been questioned effectively.

It is almost inevitable that many plans and laws concerning medical service will be presented in the next few years. The manner in which the interests of the medical profession in relation to such matters is represented is of vital importance to physicians.

PNEUMONIA PUBLICITY

A LETTER published in this issue of the *Journal* announces that the Massachusetts Department of Public Health is going before the public with information in regard to the serum treatment of pneumonia. This is an opportune time for such publicity. The pneumonia season is just beginning, and during the next few weeks more than thirty residents of Massachusetts will contract lobar pneumonia each day. More than twenty of these individuals will be ill of pneumonia of types for which serum treatment is available. Serum can save the lives of some of them and ameliorate the symptoms in a good many others.

Massachusetts was, of course, one of the first states to plan a concerted program to save the lives of those stricken with pneumonia. A recent issue of the *Commonwealth* contained the report of the five-year pneumonia program which had been carried on in Massachusetts. This pioneer work has stimulated interest in many parts of the country and at the present time nineteen states have adopted some kind of a pneumonia program and ten others are on the point of doing so.

Up to the present time very little publicity in regard to this program has been going directly to the people of the State. Most of the information has been directed to the medical profession. Because of the widespread interest in the subject, articles are beginning to appear in national peri-

odicals. Many of these are being read by laymen. For this reason it would seem to be an opportune time to place accurate facts in regard to the subject before the people of the Commonwealth.

MASSACHUSETTS MEDICAL SOCIETY

STATED MEETING OF THE COUNCIL

A stated meeting of the Council will be held in John Ware Hall, Boston Medical Library, 8 Fenway, on Wednesday, February 2, at 10.30 a. m.

Business

- 1 Call to order at 10.30 a. m.
- 2 Reading record of last meeting in abstract (published in detail in the *New England Journal of Medicine*, October 28, 1937)
- 3 Obituaries of Councilors who have died since the last meeting
- 4 Report of Auditing Committee and of Treasurer
- 5 Reports of standing committees
- 6 Reports of special committees
- 7 Appointment of new committees
- 8 Appointment of delegates
 - (a) To the House of Delegates, American Medical Association, for two years from June 1, 1938
 - (b) To the annual meetings of the five New England state medical societies in 1938
 - (c) To the Annual Congress on Medical Education and Licensure of the American Medical Association at the Palmer House, Chicago, February 14 and 15, 1938
- 9 Incidental business

Councilors are asked to sign one of the two attendance books before the meeting. The Cotting Luncheon will be served immediately after the meeting.

ALEXANDER S. BEGG, *Secretary*

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 55 BLEEDING AT EIGHT MONTHS OF PREGNANCY

Mrs. P. F., a twenty-eight-year-old primigravida was readmitted to the hospital on October 8, 1937,

A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

in the eighth month of gestation, because of the recurrence of painless vaginal bleeding

There was no family history of carcinoma, pulmonary tuberculosis, diabetes or nephritis. As a child, the patient had had measles and mumps. At the age of seven her tonsils and adenoids were removed. Catamenia began at twelve with a regular twenty-eight-day cycle, lasting four days. The last menstrual period began on February 1, 1937.

The antenatal course was uneventful until September 12, 1937, at which time she was admitted in the seventh month of gestation because of painless vaginal bleeding. At this time a suitable blood donor was procured. Sexual congress had immediately preceded the onset of bleeding. During her hospital stay she stained for the first two days only, and was discharged at the end of one week. The impression was that the patient had a placenta previa but because the bleeding had stopped, she was discharged to be observed in the prenatal clinic.

Following this the patient was seen in the prenatal clinic on two occasions. The blood pressure had a tendency to be high, averaging 140 systolic and 85 diastolic. The fetal heart sounds were normal. Examination of the urine revealed no albumin or casts. The total gain in weight amounted to 18 lb.

When admitted to the hospital at 9 a. m., the patient stated that she had flowed very freely early in the morning, but she was staining very moderately when she arrived. She had no abdominal pains or cramps and denied any local trauma. Examination revealed a well-developed and nourished young woman. The temperature was 98.6°F, the pulse 84, and the respirations 20. The pupils reacted to light and accommodation. The teeth were in good repair, and oral hygiene was good. The nasal passages were clear. The tonsils had been cleanly removed. The thyroid was not palpable. The heart was normal in size, the sounds were regular and clear, without murmurs. The blood pressure was 138 systolic and 80 diastolic. The lungs were normal to percussion and auscultation. The fundus of the uterus was seven fingerbreadths above the umbilicus, and the uterus was soft. The fetus was presenting by the vertex. The fetal heart sounds were not heard. Staining continued throughout the morning. At 2 p. m. she began to have mild labor pains at seven- to ten-minute intervals, and the vaginal bleeding increased. At 3 p. m. the mild labor pains continued at five- to seven-minute intervals, with a slow continuous loss of blood. A rectal examination revealed a thick uneffaced cervix, which admitted the width of one and a half fingers. The head was just above the ischial spines. In view of the findings, it was felt that the baby was dead, and

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Most people look on a cold as a nuisance rather than an illness which should be treated. They would not miss work for "such a little thing as a cold in the head," still

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less would they think of giving up any fun on account of it. Yet statistics show that of all the minor ailments which make a person ill enough to have to stay away from work, the common cold is by far the most frequent. Moreover, colds—especially neglected colds—are often the forerunners of more serious illnesses, such as infections of the ear, the mastoids and the sinuses, and all too frequently bronchitis and pneumonia. So we should seriously consider the question, What should be done about a cold?

But before we can intelligently answer this we must know some rather elementary but important facts about the disease we are discussing. First of all, What is a cold? It is an infection of the upper air passages, by which we mean the nose and throat. What causes this infection? The answer is, Many different kinds of bacteria, or as they are commonly called 'germs'—tiny living organisms, so small that under a powerful microscope they look like dots or dashes, but each one alive and capable of multiplying and of destroying human tissues. They are parasites and live in the human body just as a flea is a parasite that lives on a dog. They not only damage the mucous membrane which forms the lining of the nose and throat, but they send off poisons—called toxins—which affect the whole body and make the individual who harbors them feel sick all over.

If, then, these cold germs are so powerful and so damaging, what keeps them from going right on multiplying, spreading, eating and poisoning until they have destroyed the whole body? The answer is that the human body has, at all times, certain natural powers of resistance which act as a defense against these invaders, just as nations have armies to defend them against their enemies. Every cold may be looked upon as a battle between the invading army of germs and the defending powers of the body. The germs get a foothold because they make a surprise attack when the body has only its standing army—in other words, its ordinary powers of resistance—to defend it. But the body has reserves which it can call upon, and almost at once it begins to increase and strengthen its defenses, and so, under ordinary circumstances, it is soon able to overpower the germs and kill them off. If, however, the ordinary defenses are weaker than they should be, the germs may get a strong foothold, and if the reserves are not up to standard, the invaders may spread and become so numerous and firmly entrenched that it takes a long time and a hard fought battle to eliminate them. Thus, we see that the two most important factors in defense against colds are, first, to maintain a good standing army of defense by keeping in good condition, and secondly, when the battle is on, or when the cold has started, to do everything possible to hasten the mobilization of the reserves. Every time you get run down and tired, whether it be through overwork or sitting up too late, you lower your natural powers of resistance. When you feel a cold coming on is the best possible time to treat it, because by so doing you can most effectively and quickly mobilize the necessary additional defenses and so overcome the invaders before they have become too powerful.

With this conception of colds as a struggle between infection and resistance in mind, we are now ready to consider the question, What should be done about them? We have already suggested two answers. Let me state them more clearly. First, keep in good general condition, because by so doing you make yourself less susceptible to cold infections. Secondly, as soon as you realize that the infection has set in, treat it promptly, so as to try to overcome it before it is too firmly established. The essentials

of this early treatment are three in number (1) as much rest as possible, (2) drinking larger amounts of water to promote elimination of the poisons which the germs give off and (3) a laxative, if necessary, for the same reason, but do not upset normal digestive action by taking too much or taking it too often. The next rule is to avoid, so far as possible, exposing yourself to these germs unnecessarily. We cannot live entirely isolated from our fellow men, but undoubtedly the chief source of these germs is the air passages of people who have colds, and every time we get into a crowd of people the chances are that someone in the crowd is harboring cold germs—especially at this time of year. So do not go to the movies or to other large gatherings too often during the cold season, or since I know you will go, at least realize that by so doing you are exposing yourself. A more practical bit of advice, and one that you may, perhaps, be more likely to follow, is when you know that a person has a cold, keep several feet away from him as much of the time as possible. If you must talk business with him, try to sit on the other side of the room. If your work necessitates being near him, try to avoid having him breathe directly at you. And when you have a cold, try to protect the other fellow by keeping at a distance, by coughing or sneezing into a handkerchief, and by not choosing that particular time to go to visit people, especially those who you know catch colds easily or who are delicate.

To summarize what I have said a cold is an infection of the nose and throat, it is caused by germs that live in human air passages, that destroy human tissues, and that send off poisons, the human body has always a standing army of resistance against these invaders, and reserves which can be mobilized in a few days to add to this army. The important rules regarding colds are (1) keep in good general condition, and so maintain your resistance, (2) avoid exposing yourself to colds, (3) if you catch a cold, treat it early by rest, and by elimination, (4) safeguard others against catching your cold by keeping as far as possible away from them, especially the susceptible ones.

Q Would you explain to me just how these germs come to us, how we get them into our air passages?

A. Through breathing in air that someone with a cold has recently breathed out, in other words, the cold germs are passed from one person to another through the air we breathe.

Q Can we get them from the air in an empty room in which someone with a cold was, let us say, an hour ago?

A. Conceivably, but it is very unlikely. Cold germs do not live long in the air, especially if there is sunlight and reasonably good ventilation.

Q But people do not often breathe in each others' faces, do they?

A. Much more often than we realize. In kissing, in caring for a child or a sick person or in ordinary conversation there is a great deal of breathing of secondhand air. In fact, if you watch how far cigarette smoke will travel from the smoker you will realize that you do not even have to be near a person to breathe the air that he has had in his air passages. And, of course, a cough or sneeze from a person with a cold adds force and distance to the ordinary breath, which is literally teeming with cold germs.

Q But I always thought one caught cold from sitting in a draft, or watching a football game on a cold day, or getting one's feet wet—do not such things cause colds?

A. Exposure, getting chilled or wet, and the like, all

tend to lower the resistance of the body, and if we already have the germs in our air passages or receive them at such a time, they are more likely to gain a foothold because of the lowered resistance—the weakened condition of the standing army of defense.

Q I see. But why is it that some people always seem to get colds, while others very seldom do?

A. Again it is a question of natural powers of resistance. Those who are unusually subject to colds have less than the normal defense against germs. This may be due to poor general condition, to general fatigue or to some local condition in the nose or throat which impairs the local defenses in that region.

Q You spoke of the desirability of treating a cold when one first feels its coming on. What is the best thing to do at that time?

A. First, if possible, go home and go to bed at once. Secondly, drink all the water and fruit juices you can.

Q But what if it is impossible to go to bed? If you have housework to do, or children to care for, or a job that must be done, you cannot go to bed.

A. Drink plenty of water, take things as easily as possible, get to bed early, get all the sleep you can, and try to avoid giving the cold to those with whom you come in contact.

Q My experience with small children has been that when they have colds it is almost impossible to get them to drink anything. They are fretful and restless, and just cry and say, No, whenever I try to make them take even a sip. What can you do?

A. Yes, it is often very difficult to make a sick child take fluids. Usually if you can persuade them to taste a little bit of something pleasant, they will want more. But they are so uncomfortable and often so nauseated that, as you say, they refuse the first sip, and scolding or punishment for a sick child only makes matters worse. Sometimes quiet persuasion will be effective, but one trick is always worth trying. All children like sweets, and even when they are sick will seldom refuse a lump of sugar or a small piece of simple barley candy. This tends to make them thirsty, and if they are offered a drink a few minutes later they will often take it quite readily.

Q You speak of rest as one of the most important elements in the treatment of colds. What about the theory of working off a cold by taking strenuous exercise?

A. I believe that it usually does more harm than good. When one is battling against an infection, one tires easily, and violent exercise often results in an exhaustion which greatly depletes the powers of resistance.

Q What type of medicines do you recommend for colds? Are there not antiseptics which will kill off these germs in the nose and throat?

A. There is no antiseptic that is strong enough to kill germs that is not at the same time strong enough to damage the human tissues on which they are found. Therefore, the only medicines that we can use safely are those that are mildly antiseptic and so discourage the growth of germs rather than kill them off, or those that are soothing to the mucous membranes and so help to maintain their powers of resistance. But, though these may help somewhat, and often make the patient feel more comfortable, really the most important thing to take is plenty of fluid—water, lemonade, orange juice, and so on—a little milk is all right, but too much is apt to be constipating and is therefore undesirable.

Q When are colds most contagious, and how long are they contagious?

A. They are probably most contagious at the very beginning. In the first place, the germs are then most numerous, and the body has not yet developed its powers of resistance sufficiently to begin to kill them off or weaken their strength. In the second place, the first day or two of a cold is the time when there is the most sneezing and coughing, and therefore the greatest spread of germs through the air. A cold remains contagious as long as there are any germs in the nose and throat, in other words, as long as any signs of the cold persist, but it is certainly less catching in the later stages, because there are fewer germs and those that have survived are weaker.

Q What can be done to avoid spreading colds in a family?

A. Do not breathe in each other's faces, and teach the children and the adults to cover their faces with a handkerchief when they cough or sneeze. If you have a cold and must take care of the baby, tie a handkerchief or piece of gauze over your nose and mouth and keep it there so long as you are in the room with him.

Q I shall try to remember these answers, and finally, tell me again the best way of avoiding catching cold?

A. Keep out of crowded places as much as you can during the season when colds are common. And avoid fatigue, exposure and lack of sleep—in short, anything that lowers resistance.

MISCELLANY

BULLETIN OF GENITOINFECTIONOUS DISEASES

The Massachusetts Department of Public Health, in co-operation with the United States Public Health Service, is sponsoring and distributing the new *Bulletin of Genito-Infectious Diseases* edited by the Massachusetts Society for Social Hygiene. The first issue appeared in September, 1937.

With discussion of genito-infectious diseases for the first time in history no longer suppressed by newspapers and magazines, and with the United States, under the leadership of Surgeon General Parran, engaged in a campaign for the control of gonorrhea and syphilis, every such effort is valuable and timely. Education is the mightiest weapon against these diseases, and education can come only with the freest publicity. If any slogan were necessary for this modern crusade, it might well be, "Ye shall know the truth and the truth shall make you free."

MOTOR VEHICLE DEATHS FOR 1937

Motor vehicle deaths in 128 major cities increased 7 per cent in 1937 over the previous year, according to reports recently made public by Director William L. Austin, Bureau of the Census, Department of Commerce. Deaths for 1937 totaled 9964, compared with 9308 for 1936, an increase of 656. A major part of the 1937 increase occurred during the first six months of the year. Deaths for this six month period exceeded the first six months of 1936 by more than 17 per cent. During the latter part of the year motor-vehicle deaths were not essentially higher than for the corresponding period of 1936.

Considering only those deaths in each city due to motor vehicle accidents occurring in the city, the 1937 reports show a total of 7116 deaths. This 1937 figure is an increase of 326 deaths, or 4.8 per cent, over the 6790 deaths

Hospital, Battle Creek, and, in miscellaneous institutions.' From these data, therefore, I am inclined to believe that the comparison of these cities with Boston is fair since I was also informed by the Health Department of that city that 'from a special survey' they knew of 82 deaths 'in various places.' I am, however, pleased to note that in 1936 the death rate of Boston residents, 63 per 100,000 population, was 9 per cent lower than that of the year previous, and that this decline was registered at a time when in general the tuberculosis death rate was stationary or even going up in other cities.

One of the main purposes of my survey has been to bring to the attention of those interested in tuberculosis and of the registration authorities the need of a national interchange of death certificates so that proper correction for residence can be made. Even granting the difficulty of securing a complete tracing of all the out-of-town deaths of the residents of the communities studied, it must be admitted that the survey, which has been conducted with increasing efficiency over a period of years, furnishes at the present time the only fairly close approximation to the real mortality record of the large cities of the United States.

Tuberculosis, still taking so many people in the prime of life, does seem to me to remain a sufficiently serious condition that we may forget the minor question whether the death rate is one or two points more here or there. We should, instead, concentrate on attaining, as I know the authorities in Massachusetts particularly are earnestly striving to do, a real control and eradication of the disease.

I should like to add gratefully, in disagreeing slightly with Dr Wilensky as to the completeness of my annual tuberculosis survey, that here in New York City, in our development of district health centers, we have on several instances been greatly assisted by his wide experience and wise counsel, also, that on prized occasions we have been deeply inspired by the remarkable antituberculosis work and program of the Commonwealth's Commissioner of Public Health, Dr Chadwick.

G J DROLET

New York Tuberculosis and Health Association, Inc.,
386 Fourth Avenue,
New York City

RECENT DEATH

CLARK—SIDNEY A. CLARK, M.D., of 188 Bridge Street, Northampton, died January 14. He was in his seventy third year.

A native of Northampton, he received his early education in the local schools, later attending Amherst College from which he graduated in 1888. He received his medical degree from Harvard Medical School. For many years he maintained an office in Northampton being the oldest practicing physician of that city at the time of his death.

Dr Clark was a fellow of the Massachusetts Medical Society and the American Medical Association, and held memberships in several Masonic bodies, the Northampton Lodge of Elks and the Kiwanis Club.

His widow and a daughter survive him.

REPORTS OF MEETINGS

BOSTON UNIVERSITY MEDICAL SOCIETY

A meeting of the Boston University Medical Society was held on November 29. The meeting was opened by the

presentation of a case. The patient was an 85-year-old female who had been brought into the hospital because of a very slow pulse rate. Physical examination showed a well marked generalized arteriosclerosis and bilateral cataracts. There was distention of the neck veins, and they pulsed at a very fast rate. The apex rate was 40 beats per minute. Dull sounds could be heard between the slow regular beats of the ventricles. Electrocardiographic studies were made, and by putting the exploring electrode over the region of the auricles, the P waves could be brought out more clearly. These tracings showed the patient to have auricular flutter. The patient was given atropine, and due to a paralysis of the vagus, the rate was increased to 90, but there was still complete block. Following this the patient began to have auricular fibrillation—a very unusual effect of this drug.

Dr Herrman L. Blumgart spoke on cardiac pain, beginning with a brief historical introduction of the subject. The essential characteristics of cardiac pain, its location and radiation, and the various factors which determine these symptoms were discussed. The physiologic pathology of the condition and the pathological findings in patients with cardiac pain were reviewed. The particular characteristics of cardiac pain in patients with rheumatic heart disease, coronary arteriosclerosis, cardiovascular syphilis and arrhythmia of the heart were pointed out. The importance of emotional factors was discussed. Difficulties underlying differentiation from other conditions were particularly stressed, and a brief resumé of treatment was given.

Dr Pratt discussed the paper briefly from a physiological point of view. It was brought out that the use of nitroglycerin is not a sure test for angina pectoris because it relieves many other types of pain and does not always relieve angina pectoris. It is important to use the sublingual type of nitroglycerin tablets because they dissolve more rapidly in the mouth.

COMBINED MEETING OF THE SUFFOLK DISTRICT MEDICAL SOCIETY AND THE BOSTON ORTHOPEDIC CLUB

A combined meeting of the Suffolk District Medical Society and the Boston Orthopedic Club was held on November 17 at the Boston Medical Library. Dr Brewster of the Boston Orthopedic Club presided at the meeting, which was a symposium on pain.

Dr Hallowell Davis was the first speaker of the evening and talked on the modern physiological concepts of pain. He discussed the various types of pain and pointed out that there are two kinds of nerve fibers that carry painful sensations. The first type is made up of well-myelinated nerve fibers, over which impulses travel rapidly, these fibers carry sharp pain, the type that makes one respond quickly. The other kind of nerve fibers are either very thinly myelinated or non myelinated. They carry dull aching sensations and low grade pains, which probably arise from chemical changes in the surrounding tissues. The rate of travel of the sensation over this type of fiber is much slower than that of those previously described.

Dr Chester M. Jones spoke on the diagnostic aspects of pain in the thorax and abdomen. He stressed the importance of a careful history and the necessity of eliciting the exact quality and precise location of the pain. He discussed, in particular, referred pain and defined this as pain which is set up in a viscus or on a serous surface and which is referred via the spinal cord to the corresponding somatic nerve, and thence to its segmental distribution. Referred pains are usually well localized and may be de-

scribed as dull, gnawing or burning, or as frank pain. The threshold for this type of pain, as in any type of pain, varies greatly in different people. Referred pain is superficial and may cause a localized hyperesthesia, and it may be blocked by local novocain infiltration. Dr Jones has made a special study of pain referred from the gastrointestinal tract. He studied the areas of reference of pain caused by balloons distended at different levels in the gastrointestinal tract. In general it may be said that pain referred from this system is in the midline, except for that which arises in the hepatic flexure, the splenic flexure and the cecum, and in some people, in the sigmoid. Pain referred from the esophagus is in the midline and in general at the same level as the lesion. Painful lesions of the stomach are referred to a point high in the midepigastrium. The duodenum causes pain in the middle portion of the midepigastrium and lesions of the third portion of the duodenum give referred pain low in the epigastrium. The small intestine refers its pain to the periumbilical region, and the large intestine to the midline in the hypogastrium. Pain arising in the sigmoid and rectum is often felt in the midline just above the pubic bone.

Dr Jones pointed out several unusual areas of reference and said that pain may be felt only in the back at times, or it may be referred in a segmental distribution over the course of the intercostal or lumbar nerves, on either or both sides. Lesions of the esophagus can cause pain which is typically coronary in type, or the discomfort may be localized over the seventh cervical spine. Pain felt over the seventh dorsal vertebra may occasionally be due to lesions in the stomach, and the duodenum may cause pain over the eighth and ninth dorsal vertebrae, and sometimes may give rise to a belt of pain similar to a taberc crisis. Lumbosacral pain is rarely due to lesions in the lower portion of the colon, and even a full bowel may cause this discomfort. Low sacral or coccygeal pain may come from a rectal lesion, and such lesions may refer the pain to the perineum.

Dr Jones pointed out the importance of a change in the location of pain, and cited examples of patients with duodenal ulcers, who developed similar pain in a different location signifying the development of a jejunal ulcer. Magnesium oxide may cause periumbilical pain because of its stimulation of the small intestine. The pain of mucous colitis is usually low hypogastric, as it is caused by spasm of the descending colon. Since diagnosis of lesions of the small bowel is so difficult to make, umbilical pain is of great significance and should be investigated carefully, as it almost always means trouble in the small bowel. A Meckel's diverticulum, carcinoma and partial obstruction are some of the lesions which cause this type of pain.

Dr Frank R. Ober spoke on pain in certain orthopedic conditions. In the cervical region, chronic arthritis is a common cause of pain and gives rise to considerable muscle spasm. It may be fairly well localized or may be referred to the occipital region of the head. It may cause a chronic sore throat, may cause pain beneath the shoulder blades and down the arms. Pain arising from the back may be local or referred, dull or severe, constant or intermittent, and may be affected by change of position. Arthritis in the high dorsal region may at times be confused with angina pectoris. Spinal lesions may give rise to abdominal pain, which may be contralateral. Intercostal pain is a frequent outcome of spinal disease. Pain from subacromial bursitis may be referred to the elbow, wrist or hand. Foot strain may cause pain in the sole of the foot, the ankles, knees, hips or low back. Dr Ober stressed the importance of a detailed history describing the type of pain and its exact location, and giving those

motions which aggravate it. The pain described malingering is at times difficult to diagnose clearly, usually there is no limitation of motion and the patient fails to localize the pain carefully.

Dr Elliott C. Cutler spoke on the surgical treatment of pain. This treatment is used largely for hopeless cases, distinguished between two types of pain—visceral and somatic. The somatic pain is usually sharply localized, while the visceral pain, or autonomic pain, is less localized and varies in intensity. The surgical treatment is directed at the nervous system, and it is important, before instituting this, to make sure that the cause of the pain cannot be treated. Dr Cutler first discussed the treatment of somatic pain, such as occurs in carcinoma or trifacial neuralgia. Alcohol injection is frequently used in these conditions. In the pelvis, metastatic carcinoma may give rise to severe pain, and alcohol injection, posterior nerve root section, one of two types of chordotomy may be used to relieve the pain. The posterior-nerve root section is rarely done now, chordotomy is frequently used in some clinics. The simplest type of treatment is the subarachnoid injection of 100 per cent alcohol. Since alcohol is lighter than spinal fluid, it floats up around the posterior roots on the painful side when the patient lies on the unaffected side. At the present time some clinics are using 60 per cent ethyl alcohol and 40 per cent methyl alcohol. Pain may occasionally result from this procedure, but if the patient is tipped slightly forward, the alcohol tends to bathe only posterior fibers.

The viscera are sparsely supplied with sensory nerves and are relatively insensitive. They do not feel cutting or burning, but tension causes pain. Dr Cutler discussed the autonomic nervous system which carries these sensations to the spinal cord. In 1889 the so-called sacral nerve was first resected for dysmenorrhea. This was done by severing and removing the autonomic plexus of nerves around the lower portion of the abdominal aorta, and the first 5 cm. of both iliac arteries. It is used largely for inoperable carcinoma and intractable cyclopia. In angina pectoris an attempt is made to interrupt afferent impulses. This was first done in 1916 by cutting autonomic nerves. Alcohol injection of the white rami is also done. The fibers coming from the heart are present in the first to seventh dorsal ganglia, and therefore for complete sympathetic denervation, all these ganglia must be removed or injected. None of these procedures give complete or lasting relief, they are temporary and in most cases alleviate anxiety.

Dr Walter B. Cannon discussed Dr Davis's paper and pointed out that as a rule the severity of the pain is always in proportion to its seriousness. Expectation of excitement profoundly influence the degree of pain that is felt, and when a person is excited, a lesion which would normally cause severe pain is not felt. Pain is usually worse at night and may be dispelled by hypnosis. A subjective factor is very important in interpreting Dr Smithwick's paper. Dr Jones's paper emphasized the points that he had made. Dr Osgood discussed Dr Ober's paper and called attention to the fact that pain that is referred to the abdomen. Excessive lumbar lordosis may give rise to such abdominal discomfort. Pain which is localized in the end of the thumb and in the arm may arise from a transverse process pressing on the first rib or from pressure on a cervical nerve. If some abnormally placed cervical nerve plexus. If the pressure is corrected, the arm and hand pains disappear. Dr Mixer discussed Dr Ober's paper and stressed the importance of relieving chronic pain in hopeless cases.

NOTICES

ANNOUNCEMENTS

VERNON P. WILLIAMS, M.D., announces the opening of an office at 330 Dartmouth Street, Boston.

JOSEPH L. LEWIS, M.D., announces the opening of offices at 189 Bay State Road, Boston, and at 751 Main Street, Waltham.

CLINICS FOR CRIPPLED CHILDREN IN MASSACHUSETTS, UNDER THE PROVISIONS OF THE SOCIAL SECURITY ACT

CLINIC	DATE	ORTHOPEDIC CONSULTANT
Haverhill	February 2	Arthur T. Legg
Lowell	February 4	Albert H. Brewster
Salem	February 7	Harold C. Bean
Gardner	February 8	Mark H. Rogers
Brockton	February 10	George W. Van Gorder
Springfield	February 16	Garry deN. Hough, Jr.
Worcester	February 18	John W. O'Meara
Pittsfield	February 21	Francis A. Slowick
Hyannis	February 24	Paul L. Norton
Fall River	February 28	Eugene A. McCarthy

ANNUAL MEETING OF THE BOSTON MEDICAL LIBRARY

The annual meeting of the Boston Medical Library will be held in Sprague Hall, 8 Fenway, Tuesday afternoon, January 25, at 4:30.

Reports will be received from the Board of Trustees, the Treasurer, the Librarian and from the various committees. Three vacancies on the Board of Trustees are to be filled. Important business, having to do with co-operation between the Boston Medical Library and the Harvard Medical School Library, will be discussed.

All fellows of the Library are urged to attend.

JAMES M. FAULKNER, M.D., *Secretary*

MASSACHUSETTS PUBLIC HEALTH ASSOCIATION

The annual meeting of the Massachusetts Public Health Association will be held at the University Club, 40 Trinity Place, Boston, on Thursday, January 27. The sections will hold their annual meetings at 11:00 a.m., the luncheon meeting being held at 1:00 p.m.

SECTION MEETINGS

Board of Health Section

Discussion of Problems of Administrative Practice and Health Conservation Contests. Dr. Reginald M. Atwater, executive secretary, American Public Health Association, New York City.

Laboratory Section

The Registration and Approval of Public Health Laboratories as Carried Out in Connecticut. Dr. Friend L. Mickle, director, Bureau of Laboratories, Connecticut State Department of Health.

The Role of the Laboratory in the Control of Pneumonia. Dr. Maxwell Finland.

Child Hygiene and Public Health Nursing Section

The Responsibility of the Health Department in Community Health Education. Dr. Harold D. Chope, Director of Public Health, Newton.

Following the luncheon, Dr. Clarence L. Scamman, director, Division of Public Health, The Commonwealth Fund, New York City, will talk on "The Activities of The Commonwealth Fund."

G. DONALD BUCKNER, *Secretary*

NATIONAL SOCIAL HYGIENE DAY LECTURES

On Wednesday, February 2, designated as National Social Hygiene Day, three lectures on syphilis are being sponsored by the Boston Health Department. Each will begin at eight in the evening.

One will be given by Dr. Nels A. Nelson, director of the Division of Genitoinfectious Diseases, Massachusetts Department of Public Health, at the Whittier Street Health Unit, another by Dr. Fred J. Bailey, deputy commissioner of the Division of Communicable Diseases, Boston Health Department, at the East Boston Health Unit, Paris Street, and the third by Dr. H. F. R. Watts, commissioner of health, Boston Health Department, at the West End Health Unit, 25 Blossom Street.

Physicians are urged to make these meetings a success by calling them to the attention of interested individuals and by urging them to attend.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, January 25, at 8:15 p.m.

PROGRAM

Presentation of cases.

Medical Investigations in Peru in 1937. Drs. Richard P. Strong, Henry Pinkerton, and David Weinman.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JANUARY 24

MONDAY, JANUARY 24

*8:15 p.m. New England Heart Association. Peter Bent Brigham Hospital.

TUESDAY, JANUARY 25

*9:10 a.m. Boston Dispensary. X-ray Demonstration. Dr. Alice Ettinger.

*10 a.m. 12:30 p.m. Tumor clinic. Boston Dispensary.

*8:15 p.m. Harvard Medical Society. Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance).

*8:15 p.m. Boston Society of Anesthetists. Hotel Kenmore Boston.

WEDNESDAY, JANUARY 26

9:10 a.m. Boston Dispensary. Clinicopathological conference. Dr. R. C. Wadsworth. Dr. H. Houston Merritt and Dr. Arthur Berk.

*12 m. Clinicopathological conference. Children's Hospital Amphitheater.

THURSDAY, JANUARY 27

8:30-9:30 a.m. Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Peter Bent Brigham Hospital.

*9:10 a.m. Boston Dispensary. Social Service Case Presentation. Mrs. H. B. Hooker. Miss E. Grundy.

11 a. m. Massachusetts Public Health Association University Club
40 Trinity Place Boston

FRIDAY JANUARY 23

*9-10 a. m. Boston Dispensary Some Clinical Aspects of Arthritis
Dr. Walter Bauer

*10 a. m. 12.30 p. m. Tumor clinic Boston Dispensary

SATURDAY JANUARY 29

*9-10 a. m. Boston Dispensary Hospital Case Presentation Dr.
Jacob Schloss.

*10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital.
Conducted by Dr. Henry A. Christian.

SUNDAY JANUARY 30

4 p. m. Illustrated public health lecture, Faulkner Hospital audi-
torium Skin Evidences of General Ill Health. Dr. E. Lawrence
Oliver

4 p. m. Free public lecture. Harvard Medical School amphitheater
of Building D Progress in Preventive Medicine. Dr. Frederick F.
Russell.

Open to the medical profession.

JANUARY 20—Boston Society of Psychiatry and Neurology 8.15 p. m.
Boston Medical Library 8 Fenway

JANUARY 20—Massachusetts Society for Social Hygiene, 8.15 p. m. Ford
Hall 15 Ashburton Place, Boston.

JANUARY 20—New England Pathological Society 8 p. m. amphitheater
of Children's Hospital Boston.

JANUARY 24—New England Heart Association Page 95 issue of Janu-
ary 13

JANUARY 25—Harvard Medical Society Page 1-10

JANUARY 25—Annual meeting of the Boston Medical Library Page 140

JANUARY 25—Boston Society of Anesthetists. Page 95 issue of Janu-
ary 13

JANUARY 27—Massachusetts Public Health Association. Page 1-10

FEBRUARY 1—Greater Boston Medical Society Auditorium of the Beth
Israel Hospital Boston 8.30 p. m.

FEBRUARY 2—Second National Social Hygiene Day Page 49 issue of
January 6 and page 140

FEBRUARY 10—Pentucket Association of Physicians Hotel Bartlett
95 Main Street Haverhill 8.30 p. m.

FEBRUARY 14—American Board of Internal Medicine. Page 969 issue
of December 9

FEBRUARY 21—Boston Medical History Club 8.15 p. m. Boston Medical
Library 8 Fenway

MARCH 10 11 12—New England Hospital Association Page 51 issue
of January 6.

APRIL 4-8—The American College of Physicians Page 41 issue of
July 1

MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical
Society Hotel Bradford Boston.

OCTOBER 17 21—Clinical Congress of the American College of Surgeons
New York City

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

May 5—5 p. m. New Bedford

ESSEX SOUTH

FEBRUARY 2—Council Meeting Boston.

FEBRUARY 9—Essex Sanatorium Middleton Clinic at 5 p. m. Dinner
at 7 p. m. Speaker—Dr. John B. Hawes 2d. Subject: Dust and Disease.

MARCH 2—Lynn Hospital Clinic at 5 p. m. Dinner at 7 p. m. Speaker
and subject to be announced.

APRIL 6—Gloucester Hospital Gloucester Clinic at 5 p. m. Dinner
at 7 p. m. Speaker and subject to be announced.

MAY 5—Censors meet at Salem Hospital 3.30 p. m.

MAY 11—Annual meeting Salem Country Club Peabody Dinner at
7 p. m. Speaker and subject to be announced.

FRANKLIN

Meetings will be held at the Franklin County Hospital Greenfield at
11 a. m. the second Tuesdays of March and May

HAMPDEN

Meetings will be held on the fourth Tuesday in January April and
July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club Stoneham, at 12.15 p. m.
on March 16 and May 11

MIDDLESEX NORTH

Meetings will be held at the Vesper Country Club Lowell on January 26
and April 27

NORFOLK DISTRICT

JANUARY 25—Page 94 issue of January 13

FEBRUARY 23—Hotel Kenmore. 8.15 p. m. Dermatitis Venenata Due
to Cosmetics and Industrial Irritants. Dr. John G. Downing Discussion
by Dr. Francis P. McCarthy

MARCH 29—Hotel Kenmore. 8.15 p. m. Subject to be announced
but to be related to diseases of the kidney Dr. Albert A. Hornor

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each
year

NORFOLK SOUTH

Meetings held at 12 noon.

FEBRUARY 3—Norfolk County Hospital South Braintree.

MARCH 3—Norfolk County Hospital South Braintree.

APRIL 7—At the Quincy City Hospital.

MAY 5—Annual Meeting

PLYMOUTH

Meetings will be held at 11 a. m. on January 20 March 17 April 21
May 19 and July 21

SUFFOLK

MARCH 15—Joint meeting with Boston Obstetrical Society

WORCESTER

At the following meetings except the annual meeting dinner will be
at 6.15 to be followed by business session and scientific program.

FEBRUARY 9—Worcester State Hospital Worcester

MARCH 9—Memorial Hospital Worcester

APRIL 13—Hahnemann Hospital Worcester

MAY 11—Afternoon and evening annual meeting Place and schedule
of program to be announced.

BOOKS RECEIVED FOR REVIEW

*Artificial Fever Produced by physical means, its devel-
opment and application* Clarence A. Neymann. 294 pp
Springfield and Baltimore Charles C Thomas, 1937 \$6.00

Primary Carcinoma of the Lung Edwin J. Simons.
263 pp Chicago The Year Book Publishers, Inc., 1937
\$5.00

*A Primer for Diabetic Patients An outline of treatment
for diabetes with diet insulin and protamine zinc insulin
including directions and charts for the use of physicians in
planning diet prescriptions* Russell M. Wilder Sixth
edition, reset. 191 pp Philadelphia and London W B
Saunders Company, 1937 \$1.75

Practical Proctology Louis A. Buie. 512 pp Philadel-
phia and London W B Saunders Company, 1937 \$6.50

Minor Maladies and Their Treatment Leonard Wil-
hams. Seventh edition. 439 pp Baltimore William
Wood & Company, 1937 \$3.75

Pre-Natal and Post Natal Management J. St. George
Wilson. 206 pp Baltimore William Wood & Company,
1937 \$4.00

A Text Book of Ophthalmic Operations Harold Grims-
dale and Elmore Brewerton. Third edition. 322 pp
Baltimore William Wood & Company, 1937 \$6.00

*Genital Abnormalities Hermaphroditism and Related
Adrenal Diseases* Hugh H. Young 649 pp Baltimore
The Williams & Wilkins Company, 1937 \$10.00

*A Bibliography of the Works of Ambroise Paré Premier
Chirurgien and Conseiller du Roy* Janet Doe. 266 pp
Chicago The University of Chicago Press, 1937 \$5.00

A Method of Anatomy Descriptive and deductive J. C.
Boileau Grant. 650 pp Baltimore William Wood &
Company, 1937 \$6.00

The Surgery of the Sympathetic Nervous System George
E. Gask and J. Paterson Ross. Second edition. 191 pp
Baltimore William Wood & Company, 1937 \$4.50

BOOK REVIEWS

The Collapse Therapy of Pulmonary Tuberculosis John Alexander 705 pp Springfield and Baltimore Charles C Thomas, 1937 \$15.00

This book represents not only the most recent but probably the most comprehensive volume ever written on this subject. It can be considered in no way a second edition of Alexander's monograph on *The Surgery of Pulmonary Tuberculosis*, which appeared twelve years ago. The present book is new in its concept and presentation, and is exhaustively detailed.

A departure is made in the usual sequence of presentation of material by discussing end results in the first chapter. Comparative statistics are given which amply justify and stress the importance of such therapy in pulmonary tuberculosis. The multiplicity and complexity of various available procedures, which have been designed to effect a collapse of the lung, are discussed. The matter of providing the personnel and facilities for major surgery for isolated sanatoriums is dealt with, and the qualifications for a thoracic surgeon are outlined. This chapter should be of definite interest to sanatorium superintendents, boards of trustees and public-health officials.

The value of the book has been greatly enhanced by certain fundamental chapters written by collaborators. The direct and logical presentation of pulmonary physiology in relation to collapse and the authoritative discussion of pathology by Max Pinner are alone worth the price of the book. For those actively engaged in the medical care of patients, the chapter by John Barnwell on "Pneumothorax" will be materially helpful.

From the standpoint of all readers of the book the greatest interest will focus upon the chapter dealing with the choice of operation. Here Alexander indicates how he "picks his cases." Line diagrams of 84 types of pulmonary and pleural lesions are shown, each with a suggested plan of treatment. Even though it has been pointed out that the selection of operations should not be made from the roentgenogram alone, it is quite likely that this part of the book will be used in various sanatoriums as a "thumb rule" of collapse therapy, just as physicians use an indexed prescription book to suggest drug mixtures for major-presenting symptoms. Surgeons who do not know the fundamentals of collapse therapy or the basis underlying the principles of each procedure in question should have no voice in the selection of a collapse measure. Those who do will give better advice by not matching up the patient's x-ray with a book diagram, and not being guided by a proposed schedule of treatment combinations.

Other shortcomings might be pointed out for those who might consider using the book as a "bible of collapse therapy." Thoracic surgery is a relatively young branch of surgery. Many operations are not as yet standardized. Therefore, it is unfortunate that the author passes judgment on certain procedures on purely theoretical grounds. In certain instances this has been done after specifically stating that the author has had no personal experience with a particular method. It is also regrettable that certain operations receive such scant mention. Two such procedures are pneumonolysis, or lung mobilization comitant with thoracoplasty, and extrapleural pneumonolysis with maintenance of an extrapleural pneumothorax. To the reviewer it seems that these procedures may in the future be highly regarded and take an important place in collapse therapy. In such a volume the author might well have considered a chapter on roentgenologic

problems in pulmonary collapse, because of its essential bearing on the management of such patients. In the chapter on anesthesia, nitrous oxide and oxygen has been unconvincingly proposed as the ideal for such cases. The whole anesthesia problem, one of the most vital of all, is hardly treated with its just deserts.

There are so many fine things about the book, however, that its merits far outweigh its shortcomings or debatable subject matter. It can be highly recommended to all students of pulmonary disease.

Operative Obstetrics A guide to the difficulties and complications of obstetric practice J. M. Munro Kerr, with the assistance of Donald McIntyre and D. Fyfe Anderson. Fourth edition. 847 pp. Baltimore: William Wood & Company, 1937 \$12.00

This book is an extremely thorough and detailed work by a well known obstetrician and teacher. As the title indicates, it is not a book for the student but rather for the more advanced man who has had a good basic training in normal obstetrics. The book is excellently written in simple and clear English with entire absence of verbosity. The writer puts his thoughts and opinions on paper in such a way that they are easily understood by the reader. The text is well filled with good diagrams and pictures.

It is of particular interest that this work coming from Scotland differs so little from the accepted teachings in this country. There are no important points of difference in methods of treatment from those to which we are accustomed. In certain procedures the author could find support for his opinions in many of our publications. However, the practice of injecting uroselectan into the amniotic cavity to ascertain the position of the placenta seems somewhat drastic. The writer does admit that this will start patients in labor.

The author has an excellent chapter on prenatal care. Sepsis and avoidance of vaginal examinations are well emphasized. Destructive operations on the dead fetus for the sake of the mother are fully argued. This point might well be brought more often to our attention. While showing a conservative attitude toward cesarean section, the writer feels that this is frequently the proper treatment for the elderly primipara. His enthusiasm for external version in all breech positions has a very sound basis. In vertex posterior positions he favors manual rotation whenever possible. A rather simple procedure of possible value is that of pressure on the abdominal aorta in cases of postpartum hemorrhage.

In regard to anesthesia the author admits the dangers of chloroform but at the same time states that it is the most convenient anesthetic and is safe in ordinary simple deliveries. He rather surprisingly dismisses ether because of the bronchial catarrh following its use, and states that in most large hospitals nitrous oxide and oxygen is the standard procedure. He is most enthusiastic over spinal anesthesia in cesarean section and in hard, forceps deliveries. Local infiltration with novocain is recommended for perineal repair and low forceps. The author is not enthusiastic over the use of analgesics in the first stage of labor but does admit their occasional value. Chloral hydrate and potassium bromide, and morphine and scopolamine, are his first choices.

The book can be recommended most highly to those who desire a fresh and up-to-date point of view on the obstetrician's problems.

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FACTS AND ISSUES REGARDING PUBLIC MEDICAL CARE

MICHAEL M. DAVIS, PH.D.*

NEW YORK CITY

ORGANIZED medical care, supported by taxes, has long been extending in the United States. Local and state welfare officials, health officers, directors of municipal, county and state hospitals, and many non-governmental agencies including the medical and dental societies are now concerned with administering public medical care in most cities and in many counties and rural areas. How much more tax-supported medical service shall we have? The "Principles and Proposals" recently presented by over four hundred physicians have directed widespread attention to this question.

General proposals must ultimately be translated into specific plans of action. What facts are now known, what facts need to be ascertained, what issues must be faced, as a basis for plan-making? Since as regards public medical service in the United States we are not starting with a blank slate, the existing situation must be thoroughly understood before sound new plans can be evolved. The following questions are therefore important:

In what degree do the existing laws of the various states and localities and of the federal government provide a legal basis for public medical care?

What tax-supported medical services are now furnished?

What do these services now cost?

What proportion of these costs is now borne by the federal government? How much by the local and the state governments?

Who are the indigent?

Who are the medically indigent? The Committee of Physicians says: "An immediate problem is provision of adequate medical care for the medically indigent, the costs to be met from public funds (local and/or state and/or federal)."

What are the standards under which a person should or should not be eligible to receive public medical care?

What groups of the population would be furnished medical care if these principles were to be carried out?

How much would it cost to extend public medical services thus?

What would be the relation of tax supported care to the medical care furnished by private physicians and to that

furnished by non-governmental hospitals, industries and health-insurance agencies?

Legal Basis. The legal authority to furnish relief from public funds rests generally upon state laws, supplemented by the action of local units of government. Recent compilations show that there are states in which almost no systematic provision for general medical care is made, while on the other hand there are states such as New York in which ample legal authority exists for furnishing all needed medical care from public funds, not only to the legally indigent but to all persons who cannot otherwise obtain needed service.¹

General medical care for the legally indigent is furnished in widely differing degrees of completeness, or incompleteness, in different localities. It is rarely organized so as to include and co-ordinate the four needed services—in the home, in the hospital, for ambulatory patients and for preventive work. Even where the laws of a state supply ample authority to provide complete service, the extent and adequacy of care vary widely in different communities.² In general, the number of physicians, dentists and hospital beds in an area are found to be closer in proportion to the wealth of the area than to its needs.³

As to hospital care, authority for counties or cities to build and maintain general hospitals exists in many states, but only about four hundred and fifty local governments out of several thousand have exercised this power.⁴ Many other local governments, however, use tax funds to pay for care of their citizens in non-governmental general hospitals. As recent studies⁵ have shown, this policy is extending. The American Hospital Association and the American Public Welfare Association have adopted recommendations⁶ for the guidance of state and local agencies in the wise application of this policy.

The agencies concerned with furnishing medical care at the present time are largely non-governmental. About five sixths of our physicians are in private practice. Two thirds of our hospital beds for general and acute diseases are non-governmental. There are several thousand voluntary pub-

*Chairman, Committee on Research in Medical Economics.

lic health-agencies, dealing with tuberculosis, child welfare, visiting nursing and so forth. Some important business establishments, labor unions and fraternal and co-operative bodies have organized medical care for their employees or members, sometimes also for the families. A number of physicians own and operate their own hospitals or clinics. In medical research and education a large proportion of the agencies are privately maintained. The relation of public action in the medical field to existing voluntary agencies, including privately practicing physicians, is thus a question of outstanding importance.

As to federal legislation, the United States provides medical care directly only to a few special groups, such as soldiers, sailors, veterans, Indians and inmates of federal institutions. The chief federal participation in medical care is through financial aid to the states. This policy has long been established in public-health work, and the appropriations have been increased under the Social Security Act. In this large and varied country, a nationally administered system of public medical care is hardly conceivable. Most persons who consider the subject are likely to desire that the federal government continue its present policies, that is, be an assisting rather than an administrative agent.

Present Costs. The present expenditure of tax funds for medical care by local, state and national governments is about \$500,000,000 a year. This is about one sixth of the total of all annual expenditures for medical care.⁷ Of this amount, about \$100,000,000, or 20 per cent, comes from federal funds, four fifths comes from local and state funds. Furthermore, about 75 per cent is employed for hospital care, 20 per cent for public-health services and 5 per cent for home care and other services. Payment from tax funds to voluntary hospitals for the care of public charges amounts to about \$25,000,000 a year. Most of this is from local, some from state funds. In the rate of tax expenditures for medical care, excluding federal funds, there are wide differences among the states—from \$6.50 to as low as \$2.00 per capita. Within the same state even larger differences may be found between localities.⁸

Medical Care for Whom? Who are the indigent? They are those who, according to law and the policies of welfare administration, are entitled to receive the necessities of life from public funds.⁹ Who are the medically indigent? The term is used in an important way by the Committee of Physicians, but is not defined in their statement. It is apparently assumed to mean (to

quote the New York State Public Welfare Law) "persons otherwise able to maintain themselves who are unable to secure necessary medical care." The term "indigent," however, is not employed in this section of the New York law, the public authorities being simply made responsible for providing "necessary medical care" to persons as defined above. A great many people who are not receiving material relief would thus be included. The laws of many states and of the nation now recognize special groups of persons for whom certain public responsibilities are assumed, without, however, placing these persons in the legally indigent or pauper group. Examples are widows with young children, crippled or dependent children, veterans and the aged. Public-health services for tuberculosis and other diseases of public interest are also instances of tax-supported care which is supplied because a certain need exists, without involving the stigma of dependency.

Public medical service for persons who are not legally indigent has also developed substantially in hospitals and clinics. The admission of a person to a tax-supported hospital or clinic does not ordinarily carry with it the legal status of dependency, and in many communities carries little if any social stigma.

"Charity" or "Service"? How shall it be determined whether a person is medically indigent? Studies by a number of public bodies, medical societies, hospitals, clinics and other agencies¹⁰ show that inability on the part of an individual or a family to pay for medical care is a circumstance, not a status. The American Hospital Association¹¹ has issued statements for the guidance of hospitals and clinics which recognize that ability to pay for medical care must be determined by investigation of the individual case at the time care is sought, and that the essential elements to be weighed are costs as compared with family resources and responsibilities. The costs of different illnesses vary from a few dollars to many hundreds. There are diseases which may not require hospitalization but which do need expensive services for diagnosis or long periods of treatment, and which may cost as much as a hospitalized sickness.

It is apparent that the number of persons who at one time or another may be unable to pay for needed medical care depends on local standards and costs of care and on the distribution of economic resources. Those with low incomes may be continuously in that condition, and only the 10 or 15 per cent of the population with relatively large incomes are exempt from the risk of falling into it. Thus the legal status of indigency is not applicable to that large proportion of self-supporting

people who at one time or another may need medical care but are unable to pay for it, nor is the definition ordinarily associated with the word "charity" suitable for them. The phrase "unable to pay for needed medical care" is much more appropriate than "medically indigent."

Costs of Enlarged Program If certain standards of care and of costs were fixed, the existing expenditures in a given state—New York, for example—might be taken as a base and the question be asked: What would it cost if all the states were to spend as much? Roughly, the additional cost to the state and local governments outside of New York would be \$400,000,000.* This would mean approximately doubling the present tax expenditures for medical care made by all our state and local governments, except so far as federal subsidies carry part of the load. The expenditures within New York State for public medical services, however, are not considered adequate in respect to some forms of care in certain localities or in respect to all forms of care in some localities.¹² If the services were more nearly adequate than they are at present in New York State, the expenditures from tax funds would have to be substantially greater.

What would it cost if physicians were to receive reasonable remuneration for their services to all patients for whom public responsibility is assumed? No satisfactory basis for estimation exists at present, the amount required would vary widely, according to the scope of services rendered and to the methods and rates of remuneration, namely fees, full-time salaries, part-time salaries and capitation basis (so much per client per year). At the present time, some payment to physicians for general medical care in the homes of the poor is usually made, but payment to them for many other public medical services, particularly in hospitals and clinics, is supplied in but a few instances.

Sources of Support for Medical Service How are the present costs of medical care paid for? An

This statement is based on the following estimate:

	MINIMUM IN MILLIONS	MAXIMUM IN MILLIONS
Total expenditures from tax funds for medical care in the United States	500	550
New York State expenditures	\$0	
Federal expenditures	100	
	140	180
Net expenditures in states and local governments outside of New York State	3.0	370
Expenditures in states outside of New York @ \$6.50 per capita for 115 million people	745	745
Deduct	30	370
	43	33

estimate made in a recent book by the writer¹³ is as follows:

EXPENDITURES FOR MEDICAL CARE IN 1929

	FOR TOTAL POPULATION	FOR PERSONS OF MODERATE AND LOW INCOMES*
Total expenditures (donated services not included)	\$3 600 000 000	\$2 000 000 000
Expenditures from fees	2,800 000 000	1,300 000 000
Expenditures from taxation	500 000 000	450 000 000
Expenditures from insurance	170 000 000	150 000 000
Expenditures from charity	100 000 000	100 000 000

Eighty five per cent of population

An expansion of public medical services might increase the total expenditure for medical care, or might in part represent a transfer to taxation of expenditures now paid by individuals in fees. The expenditures in the last column of the preceding table might be described in another way. Self-supporting American wage earners now spend on the average 4 or 5 per cent of their incomes for medical care, but sickness falls very unevenly, so that the average is misleading. In any given year about half have small or no sickness expenditures, about a third have expenditures which run above 4 per cent (up to 8 or 10 per cent), and the remainder face still higher costs. If some present expenditures were to be transferred from fees to taxation, the result would be a lessening not only of the direct cost of sickness to wage earners but also of its uneven incidence—particularly if some tax-supported care were specially directed toward the more expensive diseases and services.

At this point, the principle of insurance as an alternative to that of taxation must be considered. In the recent statement of the Committee of Physicians, it is said: "Health insurance alone does not offer a satisfactory solution." The following facts support this statement, so far as it goes. From the economic standpoint, health insurance is a means of financing medical care, by which people pay a regular amount into a central fund (voluntary or governmental) from which the costs of sickness are met. In the United States, over two million persons now secure most or all of their medical care under voluntary health-insurance plans, and another million have joined plans which provide for hospital care only. In no country of the world does health insurance exist alone. In every European country which has health insurance, a substantial system of tax-supported medical care exists also, providing care for those persons who, because they have very small or no incomes, cannot pay contributions to a health-insurance system, and the private practice of medicine, paid for on a fee basis, also continues in these countries.¹⁴

From the financial standpoint, the following broad question of public policy is thus raised, In what proportions shall sickness costs for the mass of self-supporting persons of small means be borne

by (1) fees paid by the sick persons or their families, (2) regular assessments upon individuals, sick or well, which might be no more than these people have on the average been paying, and (3) general taxation? These are not mutually exclusive. The use to which each shall be put is a matter of degree, having regard to different social groups and also to different categories of medical care. The main point is that no program for expanding tax-supported care can proceed far without facing its relation to the principle of insurance.

The determination of sources of financial support for medical care is primarily the concern of those who bear the burden. Physicians, however, are greatly interested in the adequacy of the support and in the effects which different sources of support may exercise upon policy and upon the administration of service. From the medical standpoint, these and other medical issues equal or transcend in importance the economic questions. Among such issues are the advancement of prevention, the improvement of professional standards, the manner in which public medical care is organized and the quality of its administration.

Facts Needed An extension of public responsibility for medical care may require action by local, state and national governments, but it involves more than that. Many important agencies besides governmental ones are concerned with these matters, and not in a passive way—the medical and allied professions, industry, particularly large business establishments, most of which are interested and many of which have already been active in organizing preventive and curative work for their employees, labor unions and fraternal organizations of workers, organizations of farmers, and the co-operative societies, which in several states, particularly in rural areas, and in some cities as well, are showing active interest in the purchase of medical care. Economists and sociologists in some universities, and many social-welfare agencies, have also interested themselves in the subject.

But the focal issue is upon governmental policy in the employment of public funds. The next step in translating general proposals into working programs lies in study. The experience of foreign countries is extensive, but its application to American conditions can only be suggestive, not definitive. The large amount of experience in organized medical care in the United States has received slight collation, and very little scientific study. At the present time, an increase in public-health work and in tax-supported medical care, in hospitals and in homes, is taking place in many parts of this country, partly as an aftermath of the depression and partly under the direct and indirect stimuli of social-security legislation. In many localities the

organization of medical care under public authorities is now in a formative period, but there are a number of cities and counties in which much public medical care has been under way for years, under many different forms of organization. To aid in formulating specific policies and programs adapted to different communities, generalized studies covering large areas are now much less important than local ones. A number of careful investigations are needed in selected places. The collection of opinions about the characteristics and the quality of existing public medical care will be of little value. Field studies must be made, and some objective criteria must be applied.

Of prime importance in designing such studies will be agreement upon the criteria of appraisal. Such questions arise as these: Are there absolute criteria of scope, quality, costs and organization of service, or must criteria be relative to the needs or demands of the particular sections of the population concerned, or to the scope and character of the medical services which self-supporting persons of small means have been accustomed to secure in the same community?

Since public-health work is also extending by evolutionary process, special studies should be made of the comparative effectiveness and costs of preventive work for individuals under different systems of organization, for example, when services are performed by salaried health-department personnel or by individual physicians paid for work in their private offices. Hospitals and their outpatient departments present numerous problems by themselves, both professional and economic. Should more public funds be used for medical education and research? At the present time insufficient data are available as to the comparative expenditure for education and research from tax funds and private funds respectively. The needs for medical and hospital service in rural areas present major problems which have received all too little first-hand investigation.

Some of the most timely subjects for inquiry might be listed as follows:

The study of public services in selected communities, urban and rural, in different parts of the country, with reference to (1) scope, quality and costs of care provided, and (2) organization and co-ordination of services.

The relation of public medical care for sickness to the preventive services furnished by health departments, schools and other agencies.

The use of public funds for hospitals and clinics with special reference to (1) voluntary hospitals, (2) diagnostic and consultative services, (3) care of chronic diseases, and (4) rural areas.

The relation of public medical services in various states and communities to medical services supported by private practice, voluntary gifts or voluntary insurance.

The extent to which public funds, as compared with voluntary support, are now employed in medical education and research, and the comparative effects of each upon standards and results.

The possibilities of economic savings through the provision of adequate and co-ordinated medical care, both curative and preventive.

Estimates of need for various forms of medical care among persons who are receiving support from public funds.

Estimates of need for tax appropriations for medical care among special groups of persons—for example, the aged, or particular diseases or groups of diseases, such as cancer and chronic illness.

Effective inquiry into these subjects will require the participation of physicians with specialists in various branches of social science. Certain topics involving the qualitative elements of medical service are primarily for the physician, and his participation is always needed in designing studies and in interpreting data. But in many inquiries the primary technics of research are those in which economists, sociologists and statisticians are expert. The best development will require the disciplined thinking of medical and social scientists, followed by the participation of men of action.

These studies must be scientific, but they must not be academic. Social action in medical care is proceeding. Sickness is not postponed to await the outcome of contemplation. Nor are studies a ground for postponing action, for, as the preceding list shows, among the most significant types of study is the critical observation of current action and experimentation. A desire to lessen the suffering and economic loss from neglected sickness and to apply more fully the powers of medicine for the prevention and control of disease is daily impelling both physicians and laymen to action. The same desire leads also to the deliberate organization of experiments for working out the most effective and economical methods for accomplishing these results. Medical societies, unofficially organized groups of physicians, hospitals, co-operative societies, industrial organizations and public bodies are among the groups which have already initiated such action and experimentation. Medical service

must be judged from the point of view of the people who receive and pay for it, as well as from the standpoint of the physicians and institutions that furnish it. The participation of medical and social scientists is therefore needed in appraisal as well as in planning, and the rate and smoothness of progress will depend largely upon ungrudging co-operation between physicians and the public.

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GASTRODUODENAL ULCER

Etiology, Treatment and End Results

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THE problem of gastroduodenal or peptic ulcer is daily becoming of greater importance and interest. Originally a thorn in the side of the internist, who could neither understand its etiology nor control the permanent end results of treatment, it has involved surgeons in bitter dispute, has caused frequent compensation suits as a cause of disability, has interested insurance actuaries in its effects upon longevity and morbidity, and has become an increasing economic burden to states and their hospital systems. Bashford and Scott¹ in a study of British post-office employees have shown that peptic ulcer causes a definite loss of working efficiency. Of those so afflicted 31.6 per cent had an average annual incapacity of 30 days, 27.7 per cent from 14 to 28 days, 17.7 per cent from 7 to 14 days, and 2.3 per cent from 1 to 7 days.

Whether or not peptic ulcer is becoming more frequent, roentgenography has made its recognition easier. Growing knowledge of its clinical manifestations has brought to light many cases previously overlooked. The remark of Christian² in 1929, that four times as many cases were being treated in the wards of the Peter Bent Brigham Hospital as were formerly seen there, is significant of increasing recognition, if not of increasing incidence.

ETIOLOGY

Man is the only animal regularly subject to chronic peptic ulcer. It is plausible to link his psychic and emotional activity to the incidence of the disease. We may well ask whether the increasing incidence does not eventuate from changing economic conditions, with their resultant nervous and emotional stresses. The rise of modern industry and its problems, the bitter struggle between the classes and the workers' unprecedented political unrest may well be the sources of increase of some human diseases. The discord in the political and economic world and in family life of today must reflect itself in psychic activity and in the cerebral and autonomic nervous systems. Is it extreme to reconsider etiology from a neurogenic viewpoint?

Pathologists the world over find in autopsy statistics an incidence of approximately 10 per cent of active or healed chronic peptic ulcers. The entire alimentary tract is subject to ulcerations of un-

known origin—aphthous stomatitis, esophageal ulcer, gastric and duodenal ulcer, nonspecific ulcerative colitis, and ileitis and jejunitis as well. The lesion is always ulcerative, the variations in course and in pathology depending upon what digestive fluids serve the region affected, and upon the factors of secondary infection. In the esophagus, stomach and duodenum the acid peptic chyme predominates, in the small intestine, tryptic activity. In the terminal ileum and the bacteria-laden colon, infection soon assumes the more prominent role, though ulceration and hemorrhage may precede by months the infective colitis.

The disease occurs in greatest incidence proximal to the sphincters of the alimentary tract—before the cardia, before the pylorus, before the ileocecal sphincter, and before the rectosigmoid and anal sphincter. Two common denominators cover the entire alimentary tract—the autonomic nervous system and the digestive fluids. Function, secretion and motor activity are under the direct control of the parasympathetic and sympathetic nervous pathways, digestion proceeds under the influence of enzymatic activity. The cause of ulcer lies somewhere between the two.

Practically all the diseases mentioned occur in young people, or at least originate in youth, that most emotional period of life, and are carried over to full maturity. Just as the various kinds of insanity most commonly arise in youth, may we not at this same period expect diseases of the autonomic nervous system?

Experimentally, gastric erosions and ulcerations have been repeatedly produced by sections of the vagi (Zirni,³ van Yzeren,⁴ Ophüls⁵), by stimulation of the vagi (Keppich⁶), by extirpation of the celiac plexus (Gundelfinger⁷), and by various methods of stimulating or paralyzing the vagi or the sympathetic nerve fibers. True, the ulcers so produced in animals are not analogous to those in man, but they have occurred with sufficient frequency to demand attention, even though the results have been inconsistent. Functional derangements may well occur in the control of the autonomic nervous system over gastric secretion and motility. That such a disordered control might result in ulcer was hypothesized by von Bergmann,¹⁰ who visualized a localized ischemic spasm of the gastric or duodenal mucosa, with local resistance to peptic erosion diminished by the overexcited vagal influences upon secretion.

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It has been clearly shown that the immediate control of the autonomic nervous system rests in the diencephalon, more particularly in the hypothalamus and the cells of the tuber cinereum. Beatrice³¹ has demonstrated that stimulation of the hypothalamus increases peristalsis of the intestine and of the stomach and causes an increase of gastric secretion. Section of the vagi destroyed this effect. Kabat, Anson, Magoun and Ranson⁸ showed in cats direct inhibition of tone and peristalsis following hypothalamic stimulation, proving a direct relation between the midbrain and the sympathetic nervous system.

Carrying this reasoning a point further, it has been shown by Keller⁹ that experimental injuries to the midbrain of dogs resulted in marked hyperemia of the gastric and duodenal mucosa, even to the point of extreme congestion and outright hemorrhage, in several animals multiple erosions were produced just proximal to the pylorus. When this experiment was repeated with monkeys (Hoff and Sheehan¹⁰), mucosal erosions were created by hypothalamic injury.

Watts¹¹ has shown a definite influence of the cerebral cortex over the intestinal function. By stimulating the premotor area of the cortex, he produced intestinal rushes so that even intussusception resulted. Thus it seems that areas of the cerebral cortex may well influence the alimentary tract through the hypothalamus and the autonomic nervous system.

Most important of all are the observations of Cushing,¹² 3 cases of cerebellar tumor subjected to operation were found at autopsy to have suffered an early fatality from perforating lesions of the esophagus, stomach or duodenum. Stimulation of this hypothetic parasympathetic center was produced by intraventricular injections of pilocarpin and pituitrin, resulting in increased gastric motility and gastric hypersecretion. In the opinion of Cushing, these observations lend support to the proponents of the neurogenic theory of ulceration sponsored by Rokitsky¹³ and Virchow.¹⁴ To quote Cushing's own words:

Those favorably disposed toward the neurogenic conception of ulcer have in process of time gradually shifted the burden of responsibility from the peripheral vagus to its center in the medulla, to the midbrain, and now to the interbrain, newly recognized as a highly important, long overlooked station for negative impulses easily affected by psychic influences. So it may easily be that highly strung persons who incline to the form of nervous instability classified as parasympathetic (vagal) through emotion or repressed emotion are particularly prone to have chronic digestive disturbances with hyperacidity often leading to ulcer.

Up to this point the experimental physiologist can carry us as far as the midbrain and the cere-

bral cortex. Now step in the psychologist, the psychoanalyst and the anthropologist, combining to study the exterior stimuli and psychic traumas which, originating in the world of personal conflicts, activate the brain and the psyche, disturb the sympathetic ganglionic cord, and so react upon the physiologic function of the alimentary tract.

Eppinger and Hess¹⁵ emphasize the vagotonic individual as prone to ulcer, excitable, hypersensitive, with cold, clammy hands, spastic constipation, exaggerated reflexes, hyperacidity and vasomotor instabilities. Draper¹⁶ has added an anatomic, psychologic and pharmacologic constitutional type narrow-jawed and with high, closely fitting teeth, narrow dental arch and high cheek bones, together with a labile excitable temperament and a hypersusceptibility to drugs. Thus, too, Winkelstein¹⁷ speaks of the patient with ulcer as oversensitive to electrical stimulation of muscles, and with an exaggerated response to epinephrin and atropin.

If the ulcer "constitution" is thus hypersensitive and poorly protected from exterior stimuli, then when subjected to psychic trauma the patient reacts, not with a functional disturbance of the intestines or the stomach but with the production of ulcer. This is exactly the belief of Moschowitz,¹⁸ who has reviewed the hypothesis of the psychogenic origin of organic disease. Not alone Graves's disease but also ulcer may be the result of the interaction of psychic trauma and a susceptible nervous system. He finds the psyche of ulcer patients more or less uniform, they are highly irritable, sensitive, self-absorbed, "all-or-nothing folk." They are ambitious and aggressive, but suppress their emotions.

It is of interest to note that Rivers¹⁹ reports that of a group of physicians who were specialists, 20 per cent had ulcer. It is well known that doctors suffer very commonly from this disease. On the other hand, in the Himalayas and Japan, where the sands of life run more slowly, ulcer is an infrequent occurrence. In Negroes in the South, Rivers found only 1 possible ulcer in 200 hospital patients, and Boland²⁰ has similarly found the incidence in the Negro race half of that among Caucasians.

Alexander²¹ carries the story a step farther by finding by psychoanalysis in each ulcer case a psychic conflict between the necessity to give and the unfulfilled desire to be loved, with resultant overcompensation, of which the vomiting or constipation of ulcer may be part of an oral regressive syndrome. Thus the extreme infantile receptive cravings create a strong feeling of inferiority leading to the typical mechanism of overcompensation.

If even laboratory experiments with their exten-

sive systems of control give inconsistent results, open to doubt and criticism, how much more difficult of proof would be the establishment of the relation of psychic stimuli to organic disease?

I am very skeptical of the relation between personality and sex suppressions and psychic discords and ulcer. The individual whose past and present life is so uneventful that there are no conflict of desires and no disharmonies does not exist, to find emotional problems or minor sex repressions is only too easy, but their attribution to ulcer must in most cases be a non sequitur.

Nor must one go far afield to describe an "ulcer constitution." For every organic case there are 10 functional disturbances as seen in office practice. All such patients are hypersensitive, hyperirritable, with emotional problems and psychic restlessness. There are likely to be 9 with flatulence, aerophagia, spastic constipation or subjective distress to 1 with ulcer. The unknown factor which causes chronic indigestion and dyspepsia in one patient and ulcer in another has not yet been determined. Perhaps, as has been said by many writers, this factor is in the hypothalamus or the autonomic nervous system.

The local production of ulcer depends upon at least one constant factor—free gastric acidity. When critically analyzed by histamine test meals, all gastric ulcers exhibit free acidity, practically all duodenal ulcers show hyperacidity, and most of them show hypersecretion. A night Refuss curve taken during sleep from duodenal ulcer patients regularly shows a continuous hypersecretion of high acid titer. In reviewing the results of 600 cases of partial gastrectomy for ulcer, we have noted that where a successful postoperative anacidity obtains no recurrence ever takes place. All subsequent recurrences or anastomotic ulcers occur in cases where gastric acidity is retained.

The relation of acid to ulcer has been conclusively demonstrated experimentally. In the experiments of Mann and Williamson²² in which the bile and the pancreatic secretion were diverted to the ileum, the upper intestine thus being deprived of its normal neutralizing defense, ulcer occurred in 14 of 16 animals in the jejunal loop adjacent to the pylorus. Mann and Bollman²³ further demonstrated the progressive distal susceptibility of the small intestine. When exposed experimentally, by anastomosis, to the direct action of unneutralized peptic juice, the duodenum was least susceptible, the jejunum more so and the ileum most susceptible to the creation of ulcer by corrosive action of acid and pepsin upon an exposed segment of normally alkaline intestinal mucosa. Elman and Hartmann²⁴ produced in dogs spontaneous peptic ulcers of the duodenum by diverting the pancreatic juice and

causing its continuous external loss. A gastric ulcer was similarly produced by Hoerner.²⁵ In a personally observed case of pancreatic cyst in an adult with marsupialization, a permanent fistula developed which could not be closed. Death resulted from a perforating duodenal ulcer, the experimental conditions and observations of Elman and Hartmann thus being reproduced.

All other factors in the production of ulcer are of secondary importance or secondary to the ulcer. The gastritis described by Konjetzny²⁶ is probably the result of the ulcer rather than its cause. The whole problem of gastritis, its pathology and its clinical manifestations, is still very nebulous. The normal histology of the stomach in the various decades of life is still to be determined. That a severe suppurative gastritis or duodenitis can occasionally produce acute multiple ulcerative erosions of the stomach or duodenum is admitted, but this does not correspond to the chronic callous ulcer as seen clinically.

The bacterial hypothesis of Rosenow,²⁷ whose work has been so ably repeated by Haden,²⁸ is most striking. However, the finding of a streptococci in human ulcers does not establish their causal relation, nor are the experimentally reproduced acute fundal erosions in animals identical or even analogous with the chronic peptic ulcer of man.

Occasional cases of traumatic peptic ulcer have been noted. Direct or even indirect trauma to the epigastrium or the body may produce within twenty-four hours a bleeding ulcer of the stomach or the duodenum.

TREATMENT

That healing can take place is now beyond dispute. Time was when many skeptics believed that even in the intervals between attacks the ulcer lay open though dormant. The fact that approximately 5 per cent of autopsied cases show healed, scarred ulcers is an obvious token of their reparative ability. Roentgenologically, the progressive diminution of the size and the depth of a penetrating niche on the lesser curvature can be satisfactorily demonstrated until no lesion is seen. The average period of healing is from three to four weeks.

We have further clearly proved by studying resected specimens that ulcers heal in two or three weeks after a hemorrhage. During this waiting period after a severe melena, conservative medical treatment was followed. However, the hemorrhages, having been repeated, constituted a clear-cut indication for operation. The resected specimens showed filling of the crater with granulations, and the beginning of complete epithelial regeneration.

But ulcers are capable of repeated recurrences at the same site, frequently at stated times of the year, thus making it possible to formulate a life cycle for ulcer. Whether the recurrences appear once in three months, or once in six months, or after twenty years, their possibility is always to be borne in mind. Treatment is therefore aimed at immediate alleviation of symptoms, at healing of the defect in the stomach or duodenum and at the permanency of that result, that is, at the prevention of recurrence.

The usual conservative treatment, consisting of a modified Sippy diet, suffices for the average case. The basis of the local treatment is the use of milk, cream, eggs and cereals to neutralize the free acid of the gastric secretion, and the use of soft, easily digested foods to allay the irritability of the gastric wall. Thus also is the gastritis relieved. Frequent feeding of foods rich in protein, administered every one to two hours, with intermediate moderate doses of alkaline powders, causes a continuous neutralization of the free acid of the chyme, so that throughout the day the stomach is washed by a pabulum in which free acid has been adequately controlled. That such neutralization takes place can be proved by an indwelling Rehfuß tube during such a typical day (Crohn,²⁹ Wosika and Emery³⁰). With proper administration, free acid is absent except for occasional short intervals before feedings. The alkaline powders are a necessary adjunct, they should be given in small doses, 15 to 20 gr., so as to avoid the secondary reaction of acid production which accompanies excessive dosage, and to prevent alkali intoxication when absorbable alkalis are used.

The use of nonabsorbable alkalis such as calcium carbonate and the triple phosphates of ammonium is often advisable. They act as adequate antacids, and afford an ample substitute for sodium and magnesium salts when alkali intoxication—headaches, malaise and loss of appetite—threatens. So also the colloidal salts of aluminum, acting as adsorbents of acid, afford adequate substitutes for the soluble alkalis. Various preparations are on the market, most of them of a repulsive taste, but others in powder or suspension forms are very acceptable.

The dietary treatment should be followed strictly for four weeks, and more leniently for several succeeding months. In the latter period the diet is liberal and appetizing, including meats, puréed vegetables and cooked fruits, an adequate protein quotient being maintained, so that no patient need complain of monotony. Weight must be retained by adequate feeding, since loss in weight of over 20 per cent in ulcer cases leads to a high

mortality (33 per cent), as shown by Studley.³⁰

Ambulatory treatment suffices in the large majority of cases. In fact, the arduous necessities of today often make it imperative that a man be maintained as a functioning member of his family and of the community. Where complications exist or threaten, the course must be modified and bed rest insisted upon, otherwise the ambulatory treatment gives good results. It is better to allow a man with responsibilities and anxieties a moderate control of his affairs than to keep him in bed, fretful and restless and anxious, thus continuing the very agencies that probably activated the ulcer. The world-wide economic depression has probably not only increased the incidence of ulcer but also made more difficult a restful period of healing. Most patients could not be hospitalized if we would have them. However, intractable ulcers and the existence of complications often call for protracted bed rest. Here not only should the dietary restrictions be enforced in the strictest manner, but visitors should be excluded and sedatives more freely utilized. Since we are inclined to believe that vagus hyperactivity and cerebral overstimulation are factors in the etiology of the ulcer, sedation of the nervous system is clearly indicated. Beattie³¹ has indicated that the barbiturates have a sedative effect on the hypothalamus, their use in ulcer therapy is therefore to be encouraged.

In severe, intractable ulcers I find the milk-drip method of Winkelstein³² of great value. The continuous drip of milk at the rate of 40 drops a minute through an indwelling intragastric catheter or Levin tube maintains a constant buffer action in the gastric lumen. While the Sippy dietary method prevents free acidity only during the day, giving free play to its baneful activity during the night, the milk-drip method neutralizes it night and day. Anyone who studies the high acid secretion of a duodenal ulcer case during the night must be convinced of the efficacy of a drip treatment that combats it. Often a compromise is possible between the ambulatory day period of dieting and the nocturnal drip method. Patients may be allowed to continue at their activities, though dieting throughout the day. At night the patient is taught to insert his own Rehfuß tube and institute his own drip method.

The immediate effects of the drip method are excellent, and it is well applied to severe and intractable cases, particularly where night pain is a severe symptom. The results in a given case over a period of years, however, are not so much better as to warrant an enthusiastic and uniform employment of this rather arduous procedure. Recurrences are common with this as with all other methods. The employment of a continuous drip

of colloidal aluminum hydroxide, as advocated and practiced by Woldman and Rowland,³³ seems logical, although it offers little advantage over the milk-drip method

With other newer—or shall I call them new-fangled?—methods of ulcer treatment I have little sympathy. Mucin has been warmly advocated, most preparations are nauseating, and their results are disappointing. I doubt whether the deficit of mucin is a factor in ulcer cases (Anderson and Fogelson³⁴). The intravenous use of sodium chloride or sodium citrate is illogical, and has never gained popularity except with overzealous practitioners.

The intramuscular injection of nonspecific proteins or other chemical agencies was advocated long ago by Holler³⁵ and by Pribram,³⁶ and was reported from the Continent with some enthusiasm. The method went into desuetude, probably owing to its inadequacy, but has been revived of late in such preparations as Synodal and histidin, known to the trade as Larostidin. I have failed to find anything of value in these agencies. Reports concerning them in the literature to date are extremely guarded when given by men who value their professional reputation, and enthusiastic when coming from overzealous practitioners who evidence but little judgment. The use of histidin is based on the hypothesis of Weiss and Aron,³⁷ who observed that in Mann-Williamson dogs, histidin, an aminoacid by-product of protein digestion, was diminished in the intestinal segment subjected to experimental ulceration. They held that the parenteral injection of histidin offset the loss of aminoacid in the affected segment, and thus prevented in some cases the formation of the experimental ulcer, or encouraged its healing when formed. It does not seem reasonable to suppose that the daily injection of 5 cc of a 4 per cent solution of histidin can compensate for the extensive loss of aminoacid that results when the pancreatic and bile ducts of the dog are transplanted to the ileum. However, reports of its clinical use, as published by Bulmer,³⁸ Ratschow³⁹ and Rafsky,⁴⁰ are guardedly equivocal, while enthusiasts such as Manginelli⁴¹ successfully employed histidin in ulcer cases, gastric neuroses, angina pectoris and cholecystitis. Needless to say, controls are lacking. The relatively critical and controlled scientific observations of Sandweiss⁴² do not justify the routine employment of this injection method. The expense involved, the daily visits, the local and general reactions and the high percentage of recurrences after six months of this treatment fail to establish a case for histidin as against the more orthodox conservative dietary routine. Treatment by injection smacks more of the Continental fond-

ness for proprietary drugs, and probably redounds more to the benefit of the commercial houses that promote them than to the welfare of the patient.

RECURRENCES

To "cure" an ulcer under a given type of treatment that is based on diet and rest is an easy matter, succeeding immediately in 93 per cent of all cases (Crohn²⁰). To perpetuate that result is the problem. Recurrences are prone to follow sooner or later, usually soon. Several factors besides periodicity favor a recurrence. Excessive food or drink and disregard of dietary precautions, predicated upon a short memory for pain, are the most usual causes for recurrence. Like the obstetric patient, few persons can long remember the distressed days and painful nights of ulcer activity. People yield easily to the temptation of rich or spicy delicacies, indigestion, hyperacidity and ulcer recurrences result.

The abuse or even the moderate use of alcohol is injurious to the ulcer diathesis. Gastritis is intensified, a single orgy of drinking is often accountable for a recurrent ulcer. It is better for an ulcer patient to abstain from alcohol completely, small amounts of beer or even a weak highball in carbonated water is hardly injurious during prolonged remissions, but uncontrolled drinking and the taking of hard liquor in neat form or as a cocktail must be avoided.

The role of tobacco in ulcer is a debatable one. That tobacco, particularly in the form of cigarettes, increases gastric secretion and produces acid hypersecretion and pylorospasm has been shown experimentally and can be demonstrated in any Rehfuess test-meal experiment, it is commonly seen clinically in the catastrophes of adolescent amateur smokers. In fact, cigarette smoking can produce in a susceptible individual the picture of a pseudo ulcer, complete even to duodenal-cap deformity, resulting from smooth-muscle spasm in the presence of nicotine paralysis of the sympathetic nerve synapses. Such cases are difficult to recognize clinically and to differentiate from true ulcer, the history of the continuous overuse of cigarettes such as is commonly seen in men, and now also in women, should lead one to suspect nicotine intoxication rather than ulcer. In any ulcer case that is rebellious to treatment, suspect nicotineism. Many such cases clear up a few days after abstinence from tobacco. Cigars and pipes are less objectionable.

Smoking not only aggravates ulcer symptoms, but also causes recurrences. Scientific proof of this statement is obviously impossible since so many other factors enter into the persistence or recurrence of symptoms. I am not alone, however,

in believing that smoking is deleterious to ulcer cases, indeed, I insist upon all my ulcer patients' either giving up smoking or keeping it to a minimum

One of the commonest causes of ulcer recurrence is an upper respiratory infection mild or severe—rhinitis, sinusitis, gripe or tonsillitis. It is almost impossible to keep an ulcer patient cured in the presence of recurrent suppurative sinus attacks, chronic follicular tonsillitis or repeated head colds. Even pleurisy or pneumonia may result in a recurrence. Upper respiratory infection probably acts as an allergen to the bacteria resident in an ulcer site, rather than as a direct infecting agency. The clinical result is, however, the same. Focal infections must be eradicated where possible, this does not mean that every tonsil must be removed or every cheesy deposit regarded with alarm. But tonsils subject to recurrent inflammation, and particularly nasal septum deviations and sinus foci of suppuration, should where possible be removed.

Excessive mental or physical labor should be avoided, lest fatigue or exhaustion induce a recurrence of symptoms. Vacations and a change of atmosphere, both mental and climatologic, are beneficial, and often result in healing of the ulcer. Crises, bad news and mental anxiety often initiate recurrences.

Violent games also lead to recurrences. Handball and competitive sports should be interdicted, but golf is permissible.

COMPLICATIONS

The one complication that presents a problem in medical treatment is hemorrhage. Approximately 25 per cent of ulcer patients at one time or another suffer from gross hemorrhage, hematemesis or melena. The hemorrhage is frequently severe, alarming and threatening to life. Yet, critical as the situation appears at the moment of greatest exsanguination, it need not cause extreme alarm. In my own experience with gross hemorrhage, only 4 per cent of such emergencies have terminated fatally when conservatively handled. Since only 25 per cent of ulcer cases bleed, this gives a total mortality of hemorrhage in ulcer of less than 1 per cent, Hurst and Stewart's⁴³ estimate is 2.5 per cent of severe ulcer cases under hospital care, and Meulengracht's⁴⁴ 1 per cent. While much higher figures have been reported by other writers, among them Christiansen,⁴⁵ my experience indicates that under careful, conservative treatment the mortality is extremely low and the outlook good. Some difference of opinion exists as to whether to feed a patient during the period of actual bleeding. Hurst and Stewart⁴³ starve their patients for three days, as is

the practice at the Mayo Clinic. I have tried both feeding and non-feeding and after thorough observation am convinced that abstinence from all food is the advisable course. Very recently Meulengracht⁴⁴ has again advocated full feeding during the active hemorrhage, on the basis of neutralizing the free acidity and preventing digestion of the adherent blood clot in the open vessel or vessels. He attributes his low mortality (1 per cent) to this procedure. I still prefer three days of starvation, with the accessory use of a continuous intravenous drip of 5 per cent glucose. In this way fluid and available sugar are introduced parenterally in sufficient amounts to carry the patient over a critical period.

Opium and the barbiturates should be liberally administered so that the patient will be at complete rest and fully relaxed, mentally and physically. For a hemorrhage patient to be found awake and alert is evidence of a misdemeanor on the part of the hospital staff.

In counseling against the overuse of blood transfusions I again find myself in accord with Hurst and Stewart.⁴³ Severe reactions may ensue, causing more harm than good. With the patient well narcotized, one may await a drop of hemoglobin to 30 per cent or a fall of systolic blood pressure to below 90 mm before feeling impelled to institute a transfusion. With vigilance, skill and calmness hemorrhage cases can be handled with only an occasional mishap.

Meulengracht⁴⁴ has also recently noted an elevation of the blood urea in hemorrhage cases. This he attributes to kidney damage by the toxins through damage to the tissue. This acute azotemia in severe hemorrhage has been confirmed by Christiansen,⁴⁵ Holmgren⁴⁶ and others. Its significance and prognostic importance await further study. When anacidity is not produced, anastomotic ulcers occur in about 6 per cent of cases.

The mortality risk is much too high for the routine employment of operative procedures, recurrences are far too frequent for a prospect of lasting cure. Surgery should be restricted to carefully chosen cases, and should be employed only when protracted medical treatment has failed.

The problem of ulcer lies between a hypersensitive, irritable, often neuropathic patient, with an acid gastric factor, and his physician. The internist can "cure" the ulcer, the permanency of the result lies with the patient. Given a docile individual, mentally well disciplined, willing and able to co-operate throughout life with dietary precautions and the avoidance of nervous anxiety and excessive work, one who can take reverses and conflicts in his stride, a durable result is very likely. Again, given a patient who can prevent recurrent

infections and realizes the dangers of the overuse of alcohol and tobacco, a good prognosis is assured.

To the patient we must say, as we say to a diabetic, "Once an ulcer case, always a potential ulcer case", and so, having led him out of his ulcer crisis and guided him into the path of proper care and precaution, we leave the durability of his well-being to him.

RESULTS OF TREATMENT

The immediate results of medical treatment of ulcer cases are most satisfactory but the follow-ups are disappointing. There is no dodging the fact that most ulcers medically treated recur in time—sooner rather than later. Most of the recurrences take place within the first year (31 per cent), within one to four years approximately 50 per cent show recurrence, with symptoms. After three years only 41.2 per cent remain cured (Crohn²⁹), and after four years only 27 per cent. These figures are quoted from experience with ward cases representing the poorest class of clinical material, subject to privation and incapable, because of strained economic circumstances, of observing the proper dietary precautions and of avoiding excessive physical work and nervous anxiety. These estimates were made during the pre-depression period. Is it likely that the economic debacle has improved them? The figures of Friedenwald⁴⁷ and of Jordan⁴⁸ are more favorable because they represent private patients. But the general situation is none too hopeful.

For intractable cases—those suffering complications such as repeated hemorrhage, pyloric stenosis and perforation, and those suspected of carcinomas—surgical intervention is highly advisable, if not obligatory. When operation is indicated, partial resection is the method of choice, given a favorable subject and a skillful surgeon. By producing an anacidity, in all gastric cases and in most duodenal ulcer cases (66 per cent), recurrences are avoided. Women fare better than men, since recurrences in females after resection are most exceptional. Partial resection for ulcer is far more satisfactory than gastroenterostomy with its high percentages of anastomotic recurrent ulcers, varying from 2 to 30 per cent. While the operative mortality of resection (11 to 14 per cent) is higher than that of gastroenterostomy (2 to 8 per cent), its end result, when an anacidity is produced, is permanent cure.

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DISCUSSION

DR. THOMAS M DUDLEY, Concord When Dr Crohn started to give his address, I made a list of questions to ask him, but it seems he has answered all of them in his very thorough discussion. His remarks on etiology were most interesting. I am glad that he spent so much time on that subject, because we see so many ulcer patients who have important points in their story indicating a neurogenic factor.

He spoke of hemorrhage as a complication. Just the other day I ran across a case of supposed hemorrhage from a gastric ulcer, with a history of previous ulcer and previous treatment. The patient was a man of about forty who three or four days after a massive hemorrhage developed obstruction. We found out that he had cirrhosis of the liver, and not gastric ulcer.

In speaking of the treatment of duodenal ulcers, I was particularly interested in Dr Crohn's mention of the milk drip. That is new to me. One of the most important problems in these cases, as Dr Crohn has said, is the control of the high acidity.

I should like to ask Dr Crohn for his impression of the tribasic phosphates of magnesium and calcium. We hear a good deal about their use in place of the routine Sippy powders. I have employed them a great deal in my cases and have always been pleased with the result. As Dr Crohn says, alkalosis seems to be more written about than seen. I think I have seen 1 case, due not to the powders but to the prolonged use of Citrocarbonate by a patient in attempting to treat his own case. He had a definite alkalosis, with persistent vomiting, which cleared up when the alkalosis was corrected.

DR. W J PAUL DYE, Wolfeboro I have been asked to discuss this paper from the standpoint of surgery—my own field. Dr Crohn has covered the ground so completely that there is little to add.

The recognition and incidence of gastrojejunal ulcer have apparently increased with the complexities of our modern, hectic and at times economically unstable life. All of us, whether physicians or surgeons, frequently encounter cases of this type, and are concerned in dealing with this very prevalent and vital problem.

It cannot be overemphasized that the treatment of these cases should by and large be medical and not surgical. Primary medical treatment shows most satisfactory results—up to 90 per cent of apparent cures. Fifty per cent may show recurrence because the prescribed medical regime has not been strictly followed, but can be relieved of recurrent symptoms under strictly supervised medical treatment.

Some surgical don'ts may well be mentioned. Do not consider surgical treatment of ulcer until medical measures have definitely failed to give relief. Do not perform a gastroenterostomy as the sole operation for medically unrelieved cases without pyloric obstruction. About 16 per cent of these cases will develop a gastrojejunal ulcer at the point of anastomosis, inasmuch as hyperacidity, one of the basic factors in the development and aggravation of such ulcers, is still present. Furthermore, the symptoms of the original ulcer are rarely if ever relieved by this procedure. On the other hand, there are definite indications for surgical intervention, to be carefully considered and done in selected cases only. These are as follows:

- 1 If a strict regime of medical treatment has failed to bring relief after eight weeks or longer
- 2 After repeated hemorrhages, uncontrolled by medical measures

- 3 In cases that show persistent pain, unrelieved after a reasonably long course of medical therapy
- 4 In cases that show a partial or complete pyloric obstruction, unrelieved by medical treatment.
- 5 In cases with perforation.

When surgical intervention is definitely indicated and deemed expedient, the operations of choice are resection of the ulcer, partial gastric resection, or duodenal resection. The type of operation naturally depends on the location of the ulcer and on special considerations in the given case. As Dr Crohn has pointed out, the operative mortality for resection (11 to 14 per cent) is higher than that of gastroenterostomy alone (2 to 8 per cent). Its end results when an anacidity is produced, mean a permanent cure.

DR. ANTON J CARLSON, Chicago For thirty years I have been particularly interested in the experimental side of this subject. Dr Crohn has been a very successful and conservative worker in this field. I wonder, however, whether we should be quite so dogmatic as to say that ulcers do not occur in anacidity. I feel that this problem has not been definitely solved. I believe also that present-day statistics on the prevalence of ulcers show a great many pseudo-ulcers, based essentially on pain and other symptoms, and that if the surgeons operated they would be unable to find an organic ulcer. This probably swells the statistics considerably.

The main point I want to make, however, is this. Dr Crohn devoted much attention to the nervous and emotional factors. There still remains the problem of whether the nervous factors can produce these effects. Dr Crohn knows as well as I do that many of the emotional states, instead of producing hypersecretion, produce inhibition of gastric secretion. In many emotional states the predominant effect is inhibition of gastric motility, as well as of secretion. I base this statement not on my knowledge of dogs alone. The nervous factors are there. But do they produce this lesion by interference with the motility, by spasms, or by hypersecretion?

I was sorry that Dr Crohn introduced the term 'hyperacidity'. I have never found any gastric secretion, in ulcer or otherwise, that was above the maximum of normal acidity. Hypersecretion? Yes. Hyperacidity? No. Dr Crohn may have later evidence on that point.

DR. HAROLD D LEVINE, Bristol I should like to ask Dr Crohn whether he has had any experience with the use of lobelin sulfate to control the tobacco habit, also whether alkalosis is most prone to occur in association with nephritis, and also with cases that have retention and vomiting.

DR. FRED E. CLOW, Wolfeboro I think I speak for many of the men in this State when I say that it is not always readily determined whether we are dealing with ulcer, chronic appendicitis or gall-bladder disease, judging from my own experience, it is easy to confuse these conditions. For six years I presumably had duodenal ulcer. It was left for a London doctor to discover that I had an extremely tender appendix. He prophesied that after its removal my symptoms would disappear, and I have had no trouble since then.

There is an apparent difference in the natural history of gastric ulcers in smaller communities. The patients with whom I come in contact in such localities have recurrences at far longer intervals—three and four years—than do those in larger centers. A good many in this audience know that patients as a rule do not return. They do not follow a diet, they do not carry out any plan of treatment.

much longer than it takes for them to get rid of their most troublesome symptoms

As to the complications of ulcer, I have for some years been connected with a hospital which has had over 10,000 admissions during this time, there have been 3 perforated, gastric ulcers, removed at operation, and 1 gross hemorrhage.

DR. DAVID W. PARKER, Manchester Dr. Crohn's statistics on massive hemorrhage are very fine. Apropos of this, the other day at a meeting in the Massachusetts General Hospital, Dr. Arthur Allen gave statistics on a series of cases over several years there—a substantial number—and began by saying that 33 per cent of the cases with massive hemorrhage formerly had a fatal termination. He added that he had been able to save, by a radical operation which he had developed, 11 of 13 subsequent cases. These figures are much better than those from New York which Dr. Crohn has cited. Nevertheless, most statistics on massive hemorrhage are much worse than those he has quoted.

I should like to have Dr. Crohn elucidate his statement that trauma will cause duodenal ulcer. That is an extremely important point, from the standpoint of compensation cases.

DR. JAMES W. JAMESON, Concord One of the important points in the treatment of massive hemorrhage is to see that the patient has medical treatment, and medical treatment alone, for the results of surgery are certainly not very satisfactory. As to the type of operation for recurring ulcers, gastric resection is unquestionably the best if it can be done satisfactorily, but for most surgeons, unless they have done a number of these operations, the operative mortality is prohibitive. The results from gastroenterostomy in cases of obstruction, however, seem to give very satisfactory results in a large number of cases. Often the poor results in secondary ulcers—gastrojejunal ulcers—are due to an improper operation. Not infrequently the opening into the stomach has been carried too far and too close, the technic of operation in such cases has much to do with the outcome.

The treatment of ulcer is a serious problem, and no matter what type of treatment is given there are a certain number of recurrences. As Dr. Clow has said, the patients in New Hampshire are rather difficult to treat, even after operation. It is impossible to depend on them, yet operation will be of no benefit unless the prescribed regime is followed.

DR. CROHN Hemorrhage can take place from conditions other than ulcer. The only physical examination I care to make in the case of bleeding ulcer is not concerned with the ulcer itself, because nothing is to be gained from that. There are several things that I want to know about a patient who is vomiting blood or passing blood in the stools. Has he an enlarged spleen? Such a spleen can easily produce symptoms similar to those of a bleeding gastric ulcer. One must be careful to avoid this pitfall.

One day the Pediatrics Service posted a notice for me to go to see a baby, probably with ulcer, vomiting blood. Fortunately I did not see the notice until the next day. By that time there was a purpuric rash all over the abdomen, and it was not difficult to make the diagnosis. In older people, cirrhosis of the liver will often trip one up. I saw a case in which a gastroenterostomy was performed for duodenal ulcer. Bleeding recurred, and I thought of the

spleen. This patient did not have an enlarged spleen, the blood count was normal. He was operated upon the next day, there was no jejunal ulcer, but the case later turned out to be one of cirrhosis of the liver.

Instead of soluble alkalis we often use the basic phosphates. I did not mention triple phosphates, they furnish an excellent means of treatment. For a patient suspected of alkalosis I should certainly turn either to the triple phosphates, the colloidal aluminum compounds, or some other preparation of that type.

As regards surgery for peptic ulcer cases, I imagine that, while not disputing my position, you all believe that partial resection is the proper surgical treatment. With reference to gastroenterostomy, whether the incidence of subsequent gastrojejunal ulcer is 13 per cent or 33 per cent, the operation is so unsatisfactory that its use should not be continued.

In reply to Dr. Carlson, I am convinced that anacidity precludes ulcer. I am assuming that it is a true anacidity. In that case I do not think there is the remotest possibility of ulcer.

As to pseudo-ulcers, there are a great many of them. The nicotine complex that resembles a pseudo-ulcer is the nearest thing to a true ulcer that I know of. But the symptoms will disappear immediately upon the cessation of cigarette smoking.

Of course, when I say that the diagnosis of ulcer is very important, I mean to imply that it must be scientifically exact. It is impossible to make a successful diagnosis on the basis of clinical symptoms alone.

So far as concerns the relation of nervous factors and the autonomic nervous system to the production of ulcer, I realize that this theory is open to attack. For every ulcer case with nervousness, hypersecretion, pain and distress, I see many functional cases without ulcer. That involves a constitutional factor which we cannot reduce to scientific terms. There are a great many persons who have heart burn—high strung individuals who go through life taking bicarbonate of soda and never develop an ulcer.

I know nothing about the use of lobelin sulfate for the control of the tobacco habit, nor do I know the relation of the development of alkalosis to an existing nephritis. I do know that nephritis has been closely associated with pyloric stenosis. It has been shown that there are definite changes that take place in the kidney, characterized by calcification, this work was done by the Mayo Clinic.

As to the incidence of hemorrhage and the mortality from it in ulcer cases, the statistics given here and abroad vary widely, running anywhere from 2 to 33 per cent. I can only tell you my own experience. The high figures given as to fatalities from gross hemorrhage of the stomach are exaggerations, and are based largely on cases not scientifically analyzed, or poorly treated in earlier years. In better groups, the mortality should not be greater than from 2 to 5 per cent.

My statement about trauma is, I realize, a controversial one, but there are some well authenticated cases, particularly in French books and periodicals, of people falling from great heights, striking on the buttocks, the back or the head, the trauma being immediately followed by symptoms of ulcer. I feel, as you do, that I would hate to go to court and testify, and try to hold my ground against a sharp cross-examining attorney. Yet, I believe that trauma can be a factor.

As to the gastroenterostomy for obstruction, I think that is the most extensive operation that should ever be done.

CEREBRAL ARTERIOSCLEROSIS

Vice-Presidential Address

WALDO J UPTON, M.D *

BURLINGTON, VERMONT

CEREBRAL arteriosclerosis generally accompanies old age, but senility is not necessarily a factor. Not infrequently the vessels of the brain show typical pathologic changes in the fifth decade, and rarely in the fourth. Generally all the vessels undergo these changes, but occasionally only part of them are affected, and in some cases pipestem arteries are found at autopsy where no neurologic or mental symptoms had been found during life.

For purposes of discussion, in order to emphasize the various types of disease, we must consider atheromatous changes in the vessels with or without calcification, and the hyperplasia of the arteriolar walls found in essential hypertension. No attempt is made to show that there are different diseases, but from the psychiatric standpoint the symptoms and clinical picture vary somewhat.

In both types symptoms are generally manifested over a long period, insidious and hardly noted until the condition is far advanced. These include restlessness, both physical and mental, headaches, irritability in varying degrees of intensity, noises in the ears, described as ringing or roaring, insomnia, usually manifested by broken sleep after a short period of rest, inability to concentrate, often attributed by the patient to poor memory, definitely poor memory, more particularly for recent events but also to some extent for remote ones, and various degrees of worry and depression. In the early stages a diagnosis of psychoneurosis is frequently made, but in a patient over forty who has been physically well and has previously exhibited no psychoneurotic symptoms, arteriosclerosis or some organic disease should be suspected. A thorough physical examination, including a spinal puncture when possible, may reveal nothing, but slight hypertension, early sclerotic changes in the retinal vessels or a slight impairment in kidney function suggest a vascular change and frequently reveal the true nature of the disease. As the arteriosclerosis progresses more definite symptoms develop, they may include further impairment of memory, temporary aphasia, more pronounced and more consistent irritability, vertigo, mental confusion, tics and convulsions. As hypertension becomes more pronounced, throm-

bosis and hemorrhage of the cerebral vessels result in paralysis or death. Any severe disturbance, shock, cerebral concussion or physical injury may precipitate any or all these symptoms, and may convert a slowly developing, possibly unrecognized, case into an actively progressive one. As the disease becomes more severe, some cases never go beyond the mental stage already described, but in others the patient shows mental deterioration to a marked degree. He becomes disoriented in all spheres, or develops delusions, usually of persecution, believing that he is being poisoned, his property is being stolen, his friends are spying on him, or his wife is being unfaithful. There may be marked sexual excitement, there are hallucinations, both auditory and visual, to which the patient may react violently, bowel and bladder control is lost, all the finer sensibilities are blunted so that obscenities are common, and the disease progresses to a profound dementia in which the patient lives in a vegetative state.

These later stages are very similar to those of senile dementia, but the age of onset is generally a reliable guide, provided a rational history is available. At autopsy arteriosclerotic brains show disseminated areas of softening, small and large areas of hemorrhage, and occasionally, atrophic areas—what is described as a worm-eaten appearance. In contrast, the brain of the senile dementia patient shows a more generalized atrophy, degeneration of nerve cells and neuroglia, necrosis and fatty infiltration, and in the cortex so-called senile plaques.

In our attempt to grasp the symptomatology of the disease, a brief review of the anatomy and physiology will be helpful. Lennox¹ has found that the gray matter of the brain has a high rate of oxygen consumption as compared with muscle, and that a continuous supply of oxygen is more important than a rich supply. Interruption of cerebral circulation produces a loss of consciousness in from six to eight seconds, and permanent injury to brain substance in as many minutes. It might be expected that the brain would be rich in capillaries, but Lennox found that their numbers were much less than those in muscle, however, blood leaving the brain carried much less oxygen than that leaving the face, and a little less than that leaving the extremities. Another factor to be

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considered is the result of hypertension on the dynamics of the spinal fluid. Fremont-Smith and Merritt,² in a study of 1400 cases uncomplicated by cerebral tumor, abscess, acute infection, syphilis, cerebral edema, hemorrhage, heart failure or epilepsy, found that the cerebrospinal fluid pressure was usually within normal limits regardless of either the systolic or diastolic blood pressure, except in 6 cases which showed a diastolic pressure of under 40 mm, and 3 which showed a diastolic pressure of over 160. They concluded that there was no relation between the spinal fluid pressure and the blood pressure, either systolic or diastolic. If this is so, we may assume that the neurologic and mental symptoms enumerated above are due chiefly, if not entirely, to interference with and limitation of the blood supply by the sclerosed arteries, and that, with fewer capillaries, there would be a more marked disturbance than would be the case with tissues having a richer blood supply.

If our premise is true, the problem may be considered as that of the proper treatment of the arteriosclerosis. But by the time the disease has progressed sufficiently to permit a diagnosis there have developed neurologic and mental symptoms which must be treated, and at this stage co-operation from the patient is the exception. A thorough physical examination is necessary in order to detect other conditions which can be relieved, and to assure the patient that his case is understood and that he is free of dreaded diseases such as syphilis, cancer, heart-trouble and insanity. Having dealt with such cases for forty years, I am convinced that they should all be hospitalized, and remain so for a long time. The two or three weeks' period usually recommended is seldom, if ever, of any benefit, and I have never found that returning the patient to his home after a short hospital treatment, with instructions to continue treatment there, worked satisfactorily. Hospital routine, monotonous as it seems to some, is of decided benefit.

Occupational therapy may help one case and not another. The patient who can find interest and enjoyment in work is relieved of some of his worry, with distinct improvement in his condition provided he does not become fatigued. Other patients are irritated and bewildered by the simplest tasks and attempts to interest them merely aggravate their symptoms. In such cases simple games, walking, talking and getting outdoors are better than weaving, knitting and the like, later on, occupational therapy may prove beneficial.

Static electricity and hydrotherapy give gratifying results, both physiologic and psychologic.

Sodium iodide, administered for extended periods in small doses, is the most effective and best tolerated of the iodides, despite its failure to cure the

organic lesions, it is extremely valuable. It should not, however, be used to the exclusion of rest, physiotherapy and psychotherapy.

Sedatives are to be avoided, as they are frequently cumulative in effect, on account of poor elimination, the result being staggering, falling, mental confusion and other psychotic symptoms. Hypnotics are generally needed early in the treatment, but should be used with discretion. They can in most cases be discarded when improvement has begun. Frequent change in the kind of hypnotic used gives better results than continued use of the same drug.

Under the treatment outlined above non hypertensive patients suffering from arteriosclerosis are greatly improved, many to a degree that enables them to resume their occupation, improvement usually is lasting, and many patients treated several years ago are still active. Patients with vascular changes and moderate hypertension frequently have a remission and remain comfortable, provided they are able to live in a quiet environment without undue physical exertion or mental irritation. Markedly hypertensive cases do not respond to treatment, the vascular symptoms are usually predominant, and the prognosis is unfavorable.

The following case reports illustrate three different types encountered in dealing with the disease.

CASE REPORTS

Case 1 A 60-year-old, married, white housewife, whose past history was irrelevant except for a spinal injury 15 years previously, to which the patient made a good mental adjustment, was admitted to the hospital in September, 1936, with a history of having become upset while trying to make a garden, she became confused and lost interest. She then became suspicious over a period of several months, refused to see people because they made her nervous, and was unable to carry on her usual household activities. She was taken to two institutions, but refused to stay in either. On entry it was stated that she had refused to eat for the past 24 hours, had refused all medication, had been unable to sleep, and had refused to speak. Immediately on admission she drank a glass of milk without protest, and thereafter ate regularly. She took her medicine at the prescribed times but was suspicious of it. During the first 2 weeks in the hospital she seldom spoke and was very irritable and often passively resistive, and appeared to react to auditory hallucinations, speaking in answer to imaginary voices. Later she became restless and excited, often being under such tension that she perspired freely. Improvement was gradual, and after about 6 weeks the patient lost her hallucinations, conversed freely, was less suspicious and slept without a hypnotic, although she became nervous after visits from her grandchildren and members of her immediate family. Her blood pressure was 144/88 on admission, and varied little under treatment. X-ray examination of the aorta and carotids showed calcification, although there was no calcification of the radials.

This case showed no hypertension but definite sclerotic changes in the arteries. The patient remained in the hos-

pital for 9 months, after her discharge she continued to make a satisfactory readjustment at home. Here is an excellent example of the results achieved through adequate treatment in an institution for an extended period, 6 weeks having elapsed before there was definite improvement.

Case 2 A 61 year-old, well nourished female had taught school for 25 years, she had had meningitis at the age of 21, but made a good recovery, for at least a year previous to the onset of neurologic symptoms she had had high blood pressure. At the onset she complained of headache and inability to concentrate. The blood pressure at that time was 220/110. The patient was unable to continue teaching and went to a quiet place in the country, where she was treated for hypertension for 3 months. However, her symptoms became progressively worse, she became depressed and thought that she had lost all her savings, she had rosacea on the face and nose, and thought this was an infection by which she might infect others. She refused to eat as she could not pay for her food, and did not use her handkerchief as she could not afford to have it washed. She was very restless and nervous, and insomnia and constipation were quite persistent. On admission the blood pressure was 206/114, the heart action was regular, without murmurs. The radials were sclerosed, an electrocardiogram showed mild deviation of the axis. The face was flushed and there was rosacea over the face and nose. The patient's speech was retarded by inability to concentrate quickly and by obscuraton. She was very apprehensive, persistently asking whether it would be all right to carry on her ordinary routine. The vertigo was troublesome, and the headaches were very severe, occurring during either the day or night. The patient complained of blur ring when she attempted to read. She was depressed, and was worried because she could not pay for her care, did not eat unless urged, and thought that her presence was objectionable to other patients. Her insomnia was aggravated by her persistently getting out of bed to look for persons that she thought were about the building, apparently reacting to auditory hallucinations (which she did not admit). This condition continued for 18 days, when it began to improve. The blood pressure had dropped to 180/104. The patient slept fairly well without a hypnotic, and was not so depressed as previously. From that time on, improvement was steady and fairly rapid. 6 weeks after admission the blood pressure was 170/100, there were no headaches

vertigo or obscuraton, and vision had improved. She conversed freely without retardation, and was able to concentrate readily. Restlessness and depression were still present in a mild degree, but the patient regained a fair measure of confidence. She came from outside the State, and for financial reasons was at this time transferred to a public institution in her home state, where she is said to be making a very satisfactory readjustment.

The history and symptoms of this case are fairly typical. Quite frequently, as here, the disease has become well advanced before a physician is consulted.

Case 3 A 46-year-old railroad engineer was referred for treatment for high blood pressure with some mental disturbance, he could not be controlled outside an institution. His past history was essentially negative. He had been without symptoms up until a year before, when he had been troubled by headaches, which were traced to hypertension and responded to treatment. He developed some difficulty while at work, could not make out his train reports or understand his orders, and could not remember things from day to day. He then noted vertigo and severe headaches, occasional pains in his left chest, nervousness, and inability to concentrate, and had to stop work. On admission he was gloomy and apprehensive. His memory was poor, he complained of insomnia, was irritable and unco-operative, would not stay in bed and was very restless and irresponsible. The blood pressure was 195/120, and previous to entry had been running persistently over 200 regardless of treatment. An electrocardiogram showed coronary changes consistent with sclerotic changes in the coronary arteries. There was a systolic murmur, but no enlargement of the heart. The serologic tests were negative, as were urine and blood examinations. The patient was given hydrotherapy, nitroglycerin, theobromine and iodides, but his blood pressure did not go below 195, he went home after 2 weeks unimproved, soon developed a psychosis, and was committed to the state hospital.

This case is an excellent example of the more rapid type of deterioration which gives a poor prognosis.

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CARCINOMA OF THE COLON

A Study of Seventy Cases

DONALD S. ADAMS, M.D. *

WORCESTER

THIS series comprises all cases of cancer of the large bowel, but not including the rectum, admitted to the Memorial Hospital in Worcester from 1923 to 1934, a total of 70. The patients were observed and treated by eight surgeons and two internists.

The youngest patient was a female of twenty-four, and the oldest a male of eighty-three. There were 2 cases in the second decade of life, 6 in the third, 10 in the fourth, 12 in the fifth, 30 in the sixth (the maximum), and a drop to 6 and 4 cases in the seventh and eighth, respectively. Gordon-Watson¹ in his series of 75 cases found only 2 patients who were under thirty. Before the second decade the incidence is uncommon, although Ewing² cites cancer of both the cecum and the sigmoid at twelve. Even in the newborn and in infants it has been recorded. Although the disease is commonest in the fifth and sixth decades of life, we should not overlook its possible occurrence at any age.

The matter of sex incidence invokes considerable discussion in the literature. In our own series there are 45 females to 25 males, a ratio of nearly 2:1. Ewing,² quoting German sources, finds 40 per cent of a large series to be males but Karsner and Clark³ report the male more frequently affected, and Rankin⁴ notes the opposite of our series, or 2 males to 1 female.

In considering the site of cancer of the colon it is interesting to note first the intestinal tract as a whole. Ewing,² quoting Nothnagel's 344 cases coming to autopsy, reports 164 occurring in the colon, 162 in the rectum, 7 in the duodenum and 11 in the ileum. Lubarsch⁵ in 1608 cases found 664 in the colon, 846 in the rectum, 69 in the duodenum, 22 in the ileum and 7 in the appendix. It is generally considered that 15 per cent of all cancers in human beings affect the large bowel and that these are equally divided between the colon and rectum.

The areas affected in the colon in order of their frequency, as reported by Karsner and Clark,³ are first the sigmoid, next the transverse colon, and last the splenic flexure. In our series the sigmoid came first with 38 per cent, the cecum next with

17 per cent, then the hepatic flexure with 13 per cent and the remainder were almost equally divided, in the other areas of the colon, the ascending portion of the colon being least affected, numbering 6 per cent. The lesion was in the right half of the colon in 36 per cent, in the transverse portion in 9 per cent and in the left half in 55 per cent.

In comparing our figures with those from two other groups, as listed in Table 1, three points in common arise. They all agree, first, on the preponderance of sigmoid cases, secondly, on the almost identical figures in terms of percentage as regards the sigmoid, and thirdly, on the greater proportion of left-sided involvement.

Table 1 Site of Colon Cancer

	KAUFFMANN ⁶	KARSNER AND CLARK ³	MEMORIAL HOSPITAL
Cecum	19.4	13.5	17
Ascending colon	7.5	17.3	6
Hepatic flexure	7.5	5.8	13
Transverse colon	11.6	17.3	9
Splenic flexure	10.3	7.7	9
Descending colon	5.3	—	5
Sigmoid	38.4	38.5	38
Right half of colon	34.1	36.5	36
Transverse colon	11.6	17.3	9
Left half of colon	54.1	46.2	55

It is generally conceded that the etiology of this disease is unknown, and our cases bear out this conclusion. Yet the literature advances numerous possible factors, such as chronic irritation arising from hard feces, or from colitis and amebic dysentery. Mention is also made of certain vitamin deficiencies, and heredity. We know that polyps in the large bowel may have a tendency to malignant change. Karsner and Clark³ estimated that 40 per cent of all cancers in this region arise from polyps. Nystrom, quoted by Dixon,⁷ goes farther, and considers that 63 per cent of cancer in this region arises from polyps.

Steindl⁸ notes that 22 per cent of a series of bowel cancers were inoperable, probably because of diagnostic errors which resulted in delayed treatment. In our group the outstanding mistake before hospital admission was treatment for what was thought to be constipation and hemorrhoids. After the cases had reached our hands, cancer of the right half of the colon was confused with both gall-bladder disease and appendicitis, also, operations were performed for supposed disease of the pelvic adnexa, which proved to be left-sided.

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large-bowel cancer With a more careful study of the history and a barium enema, the preoperative diagnoses in these cases would probably have been changed It should, however, be borne in mind that occasional cases of cancer cannot be diagnosed with certainty It is in this type of case that exploratory incision is indicated

Dixon⁷ and his colleagues note that the greatest number of errors in diagnosis of cancer on the right side occur in patients with unexplained secondary anemia, pernicious anemia, peptic ulcer, gall-bladder disease or appendicitis with abscess, on the left side, appendicitis, colitis, spastic colon and disease of the pelvic adnexa cause errors in diagnosis He quotes Rosser, who observed a similarity between cancer of the cecum and the ascending colon and appendicitis, but points out that patients with new growth show weakness and anemia but no temperature Bloodgood⁹ warns that transverse-colon cancer in particular may simulate gastric disease, even to the point of loss of hydrochloric acid

In our cases the following complaints were listed: complete inability to move the bowels, a change in bowel habits to the point of unusual constipation, pain, gas, with and without unusual distention, nausea, vomiting, bleeding from the bowel, weakness, diarrhea, a persistent tender localized area in the abdomen and indigestion In addition, patients stated that they could feel a mass within the abdomen, which was verified in each instance. In 36 per cent only a single complaint was made, whereas in 64 per cent there were two or more from the list just given

The outstanding symptom was pain In only 2 instances in this series was it absent, both cases being partially obstructed by growths in the left lower colon This pain varied from a dull, gnawing sensation, usually near the region affected, to the generalized paroxysmal type caused by obstruction The former, associated with edema and inflammatory changes about the lesion, caused its local effect by direct pressure on surrounding parts The right half of the colon is more subject to these changes than is the left, where partial or complete occlusion of the bowel lumen by the new growth is the direct cause of the pain

Changes in bowel habits were next to pain in frequency Eighty-five per cent of the patients in this series showed constipation in some form, 27 per cent noting it as an outstanding symptom, which came on gradually, the bowels having been regular There was a small group who had no constipation, and in whom there was no apparent need for enemas or cathartics Of this group, 4 were left-sided cases with annular growths Apparently the patients were operated on when the bowel lumens were still sufficiently patent

It is of interest to note the duration of these symptoms before hospitalization Our series showed an average of eighteen months as compared with one year reported by Rankin,⁴ and eight months reported by White.¹⁰ The cases where the left side of the colon was involved showed longer preoperative periods than did the right-sided cases. Our average is influenced by the inclusion of the case of an elderly man with an annular growth in the splenic flexure, who voluntarily stated that his first symptom of discomfort and a feeling of something wrong under the left costal margin antedated operation by fourteen years

Sixty of our 70 cases, or 86 per cent, received some form of operative treatment. Of the 10 unoperated patients 2 left the hospital for treatment elsewhere, the other 8 were either in such poor condition that operation was not attempted, or died before anything could be done. The diagnoses were established by clinical means, by postmortem examination or by operative findings at hospitals to which the patients were transferred

The 60 cases operated upon were handled in five different ways Fifteen were treated by simple colostomy This procedure was used either as a palliative measure to relieve obstruction in feeble patients and in those obviously suffering from metastases, or as a method of bowel decompression prior to a proposed resection The operation has its place, and it was surprising to find that a number of these patients obtained relief and lived for some time.

Eight patients received some form of sidetracking around the growth This is a cleaner procedure than simple colostomy, and was chosen because of extension of the new growth and a desire to overcome the obstruction without an external colostomy

Nine patients were explored without an attempt to treat the growth These operations were done when perforation of the lesion had taken place, or where the cancer was too far advanced for either colostomy or sidetracking Nothing was accomplished in any of this group

One patient had a simple excision of an early growth of the cecum Here a subtotal hysterectomy was followed by a routine appendectomy The growth was discovered and removed

Twenty-seven patients were treated by resection of the affected bowel Of these, 26 per cent had some form of bowel decompression before or during the operation Resection with ample margins is the procedure of choice The matter of a preliminary ileocolostomy or cecostomy is open to debate. Its use had a bearing on our mortality table, however Being in favor of bowel decompression, I was glad to find that Rankin⁴ recommends its use rather than the one-stage method He uses a

preliminary end-to-side ileocolostomy for right-sided growths, and a cecostomy for left-sided ones Rankin also quotes Whipple, whose summary of the value of preliminary bowel decompression is most excellent "It allows proper cleansing of colon before resection Puts the anastomosed parts at rest until healing is complete Increases patients' comfort by eliminating ineffectual peristalsis It eliminates the use of enemas and irrigations during period of repair Its value is not only with complete obstruction but partial as well" Another well-known argument in its favor is the marked recession in size of the inflammatory reaction about the obstruction, which simplifies the resection

The Mikulicz procedure was not employed in this series Although when applicable it offers a satisfactory means of removing the new growth and re-establishing the continuity of the bowel, it is often followed by the surface implantation of cancer cells

Mortality in our series is considered in two groups, the operated and the unoperated cases The operative mortality, as shown in Table 2, was 28

Table 2 Immediate Mortality in Operated Cases

NO OF CASES	OPERATION	OPERATIVE MORTALITY	
		No Deaths	Per Cent
15	Simple colostomy	5	33
8	Sidetracking	0	—
9	Simple exploration	4	44
1	Simple excision	0	—
27	Bowel resection	8	30
60		17	28

per cent Of the 10 unoperated cases 6 patients died in the hospital These were in a moribund state on admission The 4 who left the hospital alive either desired transfer elsewhere for operation or went home to die after refusing treatment

In this series, adenocarcinoma was reported in all cases Metastases from the original lesion were found to extend locally, to regional lymph nodes, and to distant parts No bony involvement was noted The liver was the organ most commonly involved One patient had, in addition, lung and brain extension Clogg¹¹ describes the ovaries as occasional points of invasion In keeping with this, 1 patient in our series had a satisfactory resection of the transverse colon but returned in two years with an involvement of one ovary A year later the other ovary was affected with a fatal termination

Of the 23 hospital deaths, 10 came to autopsy, the sigmoid was the predominating site in 8, the cecum in 1 and the descending colon in 1 Of these 10 patients, 3 who had had resections of the sigmoid or the descending colon died through failure of the sutures to hold, with resultant peritonitis The disappointing fact here was that no

metastases were found and that the lesions had been excised with good margins Three autopsied patients who had colostomies died from heart, kidney, or lung complications At autopsy these presented local and general extension Three others were not operated on, of these, 1 died from cardiac disease and would otherwise have had a good prognosis, as no metastases were found, 1 had an unrecognized sigmoidal growth with perforation and local extension, in the third, the cecum, liver, lungs and brain were involved The tenth autopsied patient had an exploratory incision with an attempt at peritoneal drainage, the findings were perforation of a sigmoidal growth with general peritonitis, and localized metastases The striking factor in these postmortem examinations was the large percentage—70 per cent—where metastases either did not exist or were well localized It was also noted that the older the patient the more localized was the cancer

The end results in the patients who left the hospital alive but subsequently died are listed in Table 3

Table 3 Average Survival of the Cases Which Died after Discharge from the Hospital

NO OF CASES	OPERATION	AVERAGE LIFE AFTER LEAVING HOSPITAL
4	None	6 mo.
10	Simple colostomy	10
8	Sidetracking	15
5	Simple exploration	4
13	Bowel resection	2 yr

Seven patients are alive and well today Further data concerning them are given in Table 4

Table 4 Data on Surviving Cases

DIAGNOSIS	OPERATION	LENGTH OF LIFE SINCE LEAVING HOSPITAL
Cancer of sigmoid (Grade I)	Resection	6 yr
(Grade III)		3
cecum (Grade II)	Local excision	7
(Grade II)		10
ascending colon (Grade IV)	Resection	8
splenic flexure (Grade II)		3
(Grade II)		3

In conclusion it should be emphasized that to get the best results in carcinoma of the colon as in other forms of cancer, early diagnosis and treatment are essential To this end, not only the surgical profession but the public must become, as Bloodgood has expressed it, "cancer conscious" This necessitates placing the facts squarely before the public The family physician should be reached both by word of mouth and by articles in surgical periodicals The medical student and the house officer must be properly instructed in the taking of histories and the making of examinations in cases where there is a derangement of the intes-

unal tract. Finally, the surgeon must not only be able to operate on these cases intelligently, but must share in the training of the house officer and in the latter's diagnostic responsibility. With our present-day knowledge, few cases of large bowel cancer should be overlooked.

I am indebted to Dr. James P. Beck, pathologist of the Memorial Hospital, for the checking of old sections and the grading of tumors.

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DISCUSSION

DR. EDWARD L. YOUNG, JR., Boston. With cancer producing such an enormous mortality every year, Dr. Adams's subject is a highly pertinent one, particularly as in cancer of the large bowel, given an early diagnosis and competent treatment, there is such a good prognosis.

Dr. Adams did not mention one thing that I have particularly noticed, that is the slight show of blood before other symptoms, with or without a change in the normal bowel habits. This is often the first symptom to be observed, and should be followed by immediate and adequate study, particularly repeated guaiac tests and barium enemas, done by a competent roentgenologist. I would rather send a patient to a roentgenologist and have him report that there is nothing there than to wait an unnecessarily long time.

When the diagnosis is made, preoperative treatment is very important. First, the patient must be prepared mentally, and should spend several days in the hospital before operation. He should be told that in all probability there will have to be two operations. The preoperative treatment is the restoration of the chemical and water balances, and also the local preparation of the bowel. The ability to complete this preparation satisfactorily, and the surgeon's experience and ability, will determine whether in a given case he can do a one-stage operation to advantage. That must be so where obstruction is insufficient to prevent adequate bowel preparation, yet in nearly all cases we may say that a two-stage operation gives a better prognosis than a one-stage operation. The cases which Dr. Allen has recently reported from the Massachusetts General Hospital bear this out very well.

There is also the question of preoperative peritoneal stimulation. I still believe that it is worth while as a means of decreasing the risk of peritonitis.

As to the type of operation, in my hands aseptic anastomosis gives the best results. For two years I have asked the pathologist to tell me if my suture material cultured at operation should fail to develop bacteria. I have not a single report of the kind. I can put catgut around an ap-

pendix stump, culture the remnant and have it reported "No growth." I cannot do this in an anastomosis of the large bowel. In other words, I doubt whether aseptic anastomosis is anything but a relative term, nevertheless, I believe this operation in some form gives a better opportunity for a clean healing than the other methods. I prefer clamps to the Kerr basting thread method, as giving better control of the bowel and carrying less danger of an obstructing diaphragm forming within the lumen.

It is essential that all cases successfully operated on shall have a regular postoperative check up. The percentage of carcinomas of the large bowel arising from polyps is high (some observers have even put it at 100 per cent). Polyps of the large bowel are so likely to be multiple that even though the roentgenologist before operation says that there is only one growth, and the surgeon on examining the large bowel at operation can find no others, there may be more of them. A secondary growth may start, and the patient may have as good a chance of cure on the second operation as he had on the first. For these reasons I consider routine postoperative check ups essential.

DR. CHARLES L. LARKIN, Waterbury, Connecticut. Dr. Adams, and Dr. Young have both stressed two requirements for the proper treatment of carcinoma of the colon. The first is that such cases must be seen in an early stage if better results are to be obtained than those which now prevail. The second is that the surgeon must be skilled in this branch of surgery. Neither of these requirements seems unreasonable, but I doubt whether the first will ever be accomplished, and certainly the second cannot be attained in communities of one hundred thousand inhabitants or less until the present medical and surgical educational facilities are augmented by intensive postgraduate study.

The only way in which early cancer of the colon will ever be discovered lies in compelling every adult above the age of thirty-five to submit to a thorough annual physical examination by a competent physician, and a routine examination of the whole gastrointestinal tract by a competent radiologist. This is of course impossible.

In Connecticut the State Tumor Committee tried to enlist the physicians of the state in a concerted effort to influence their patients to have annual physical examinations. Every doctor in the state was approached, and it was proposed that they should send out to every patient, above thirty-five, cards that read something as follows:

My Dear Mr. [or Mrs.]

The Connecticut State Medical Society recommends a yearly complete physical examination by a competent physician or surgeon as the best means of preserving health. I am in agreement with this policy and suggest that you call at my office on _____ at _____ for a check up.

If the above date is not convenient for you, please notify my office.

M.D.

The committee failed absolutely to obtain the co-operation of the doctors.

This year the committee is trying to educate the public as to the cancer menace, and to urge everyone to submit to his physician once a year for examination. I do not feel confident, however, even if people do so, that our purpose—that is, the early diagnosis of cancer—will be accomplished. Certainly so far as early cancer of the large bowel is concerned we are doomed to failure, because there are no recognizable symptoms. When such a cancer bleeds it is no longer an early one. When it causes pain it is no longer an early one. When it gives symptoms of

obstruction or even partial obstruction it is no longer an early one.

Another reason why we are unlikely to discover early cancer of the large bowel is that the average physician is too busy taking care of minor ailments to have his patient strip, to look into every orifice, to examine all the excretions, and to do everything necessary in a complete physical examination. Such examinations take time, and the general practitioner, his office filled with patients each representing a small remittance, cannot afford to spend an hour on one patient and find that the others have walked out of his office.

In a city the size of Boston it may be easy for a patient suffering from cancer of the large bowel to find a surgeon skilled in this field, but in the smaller communities he can rarely do so. In Boston and New York there has been a tendency to segregate these cases in one or two hospitals, and some surgeons, such as the late Dr. Jones, have become skilled in handling them. These men have taught other surgeons and interns in their hospitals the necessary technique, so that today the surgeons in such hospitals as the Massachusetts General and Pondville are obtaining results far superior to those achieved in the smaller hospitals. Most of us surgeons in the latter have never received training in this special line. I myself was an intern in one of the best general surgical hospitals in this country, — St. Luke's in New York, — and I do not remember seeing one abdominoperineal resection of a cancer of the rectum or sigmoid. Since starting practice in Waterbury, Connecticut, a city of 100,000 people, I have rarely seen a cancer of the colon.

At the Waterbury Hospital during the last five years only 19 cases were seen. This is a hospital of 300 beds, and the 19 cases were divided among six surgeons. It can be readily seen that no one of us has handled enough cases to become skilled in this field, and we never shall be skilled unless we are given the opportunity to take a postgraduate course at one of the larger cancer clinics. Surgeons who are connected with larger cancer hospitals would make an outstanding contribution if they were to give such a course once a year to young surgeons on the staffs of small hospitals. It will then be an easy matter to allocate all cancers of the colon to these men, and the results obtained at the smaller hospitals will then compare more favorably with those obtained at the larger institutions. The medical schools at Yale and Harvard and elsewhere in New England are failing dismally in their duties when they neglect to provide for the proper postgraduate education of practicing surgeons in this section.

DR. FRANK H. LAHEY, Boston. We have said before, and everyone agrees, that we must interest ourselves seriously in this problem of carcinoma of the colon and rectum, particularly because it is such a favorable lesion for treatment. We have done 725 operations on patients with carcinomas of the colon and rectum, of which 46 per cent were in the colon. The end results show that 47 per cent of the latter patients are alive and well and without recurrence more than five years after operation, and that 42 per cent of the patients with carcinoma of the rectum are alive and well without recurrence, that is, those patients who had the radical operations. Again I call your attention to the fact that the treatment of this lesion is very favorable, it is one of the most hopeful situations for cancer with which we deal, and it is, therefore, worth while to interest ourselves seriously in it, and to convince our patients that carcinoma in this location is far from hopeless.

We must not let the question of age interfere with operability. Last year we sent home a boy of twelve for

carcinoma of the rectum, and a man of seventy-four who had had abdominosacral removals of a carcinoma of the rectum. Neither must we interest ourselves too much in mortality figures. This has been stressed again and again. We have increased our operability from 54 per cent to 74 per cent, with a mortality in carcinoma of the colon of 9.6 per cent. It is very easy to keep the mortality low if the hopeless or dangerous cases are rejected, but we believe that operation should be performed on patients with metastases in their livers, even with quite extensive metastases in their mesenteries, if the primary lesions can be removed. This is an infinitely better operative procedure than the temporary or so-called palliative colostomy, which really does not palliate.

A word must be said regarding the Mikulicz operation — I do not mean this critically of Dr. Adams, but after all one must report his experience in order that everyone may make his own interpretation. Let us throw out the question of wound implantation of cancer in this operation. It does not occur, unless the old Mikulicz procedure is done and the living carcinoma is implanted in the wound. If the modified Mikulicz procedure is performed, with the excision of the carcinoma between clamps at the time of operation, wound implantation is impossible. We must therefore not think of wound implantation as one of the dangers of the Mikulicz procedure.

We have done so many Mikulicz operations and with such good results that I should like to show the dangers that we have encountered and that may occur to any of you. First, in resections of the splenic flexure almost nothing has ever been said about the danger of injuring the root of the mesentery next to the jejunum, which accounts for some deaths in operations of any type at this level. If the resection is carried down to the root of the mesentery, care must be taken to stop it before reaching the point where the jejunum becomes retroperitoneal. At this point the mesenteric root is thin and easily torn. It is extremely difficult to suture the mesenteric peritoneum at the root of the mesentery in the jejunal fossa. We have had an avoidable fatality from such sutures' tearing out, thus permitting the herniation of loops of jejunum through the resultant hole in the root of the mesentery. We therefore recommend that the resection of the mesenteric root here be always short. Where the mesentery surrounds the root of the jejunum, a good sized apron of mesentery should be left so that the edges can be readily approximated.

Another point of value in dealing with the Mikulicz procedure is that carcinomas of the sigmoid flexure are frequently situated so low that when they are removed not enough rectum and sigmoid are left for the operation to be accomplished. There will, however, not infrequently be a short stump of sigmoid and rectum which can be brought straight up to the skin. Several times in such cases it has been possible for us so to mobilize the splenic flexure that the descending colon could be brought down, placed parallel with the straight tube of sigmoid by bringing it down into the pelvis, then carried back up along this straight tube of sigmoid and rectum, to which it is attached by tacking sutures, thus forming the straight double barreled loop of the Mikulicz, which points straight into the pelvis. The result is an angulation of the upper segment of bowel at its lower point where it is kinked deeply within the pelvis, should postoperative distention occur, as it not infrequently does after this operation. Traction on the sutures at the angulated point of bowel will result, and in our experience has resulted in pulling out the sutures, with the production of leakage and of

peritonitis. We therefore feel that when this maneuver is undertaken, by which fecal streams can be restored even in some of the cases in which the lesion is low, a complete transverse ileostomy should be done so as completely to sidetrack any feces, thus preventing them from passing through this angulated point until the spur has been cut and firm union between the two loops has taken place.

Still another point which Dr Cattell has brought out is that in anchoring the colon in the wound in colostomies the peritoneum should never be sutured either to the mesentery or to the bowel itself. Instead, he has devised the scheme of tying into the last suture a tab of epiploic appendage as the peritoneum of the abdominal wall is sutured snugly about the bowel. This results in support to the opening which prevents it from falling back, and carries no danger of penetration of the tube of bowel wall, and consequent fecal soiling of the wound.

Several of our colleagues throughout the country have told us that they had trouble in closing the intestinal fistulas which follow the cutting of the spur, when patients return at the end of two months for closure of the colonic stoma in Mikulicz operations. We believe that much of this difficulty is due to failure to clean off thoroughly the edematous tabs of epiploic fat and to ligate adequately any indurated mesentery that extends above the levels of the fascia. When the intestinal tube of a secondary Mikulicz closure is to be turned in, it should be as free and flexible as normal bowel wall, in this condition it can be accurately inverted and closed with mattress sutures, so that there will be no danger of leakage.

Dr Cattell has likewise demonstrated that it is unnecessary in many of these cases to separate the tube of intestine from fascia and muscle, but that the closure can be satisfactorily made directly beneath fat and skin.

DR. ARTHUR W. ALLEN, Boston The question of whether we should operate on colon cases in one stage or in two warrants a few remarks from me, since I have recently been challenged by my good friend Dr Harvey Stone, of Baltimore, in an editorial in the October issue of *Surgery*. This happened to be published in the same week that my article came out in the *Journal of the American Medical Association* which advocated a two-stage procedure, particularly as it applies to the right colon, and tried to prove its advantages from statistics.

Dr Stone says he does not believe that we should rely on statistics but admits that he does not know what his own statistics are. It is extremely difficult for any one person to gain experience rapidly in this field. It will take any one who operates on these cases quite a while to find out what his own mortality is, whether he adopts a one stage or a two-stage procedure.

Between 1925 and 1936, surgeons at the Massachusetts General Hospital were definitely one stage minded, there is no getting around that. In spite of this we did 253 two-stage operations along with 400 one-stage ones. Most of them were done on the poorest risks—patients who were obstructed and elderly patients who arrived in bad condition. The 400 cases done in one stage represent the better risks but the mortality was 19.2 per cent, whereas that of the two-stage operations was only 13 per cent.

I am particularly interested in the more favorable tumor that occurs in the right bowel, where there is at least a 60 per cent chance of a five year cure, and where the operation is so easy. The patients are not obstructed and are often in excellent condition so that it is a temptation to operate in one stage.

All I ask is that you consider very carefully this mortality table 20 per cent died in the group of one stage resections of the right colon, while in 28 cases only 2 deaths

(7 per cent) occurred when the two-stage procedure was used.

Why should the two-stage procedure be more seriously considered? One hears of the double risk of anesthesia, of the double risk of infection, of the increased hospital stay and of the terrible psychic trauma to the individual who has to face two operations instead of one. Well, peritonitis is the leading cause of death in this field of surgery, and in the one stage procedure we lost 24 patients. In the very unfavorable group of obstructed and old cases done in two stages we lost 9. The assertion of a double risk does not seem to be borne out by these figures.

Pulmonary complications rank next as a cause of death. Many of these patients die of pneumonia or collapse of the lung. In the one stage cases we had 22 deaths from this cause, and in the two-stage group, with the double opportunity for a fatal result, there were only 6 deaths.

I beg you to think seriously about the increased safety in two-stage procedures, until you have had sufficient experience in this field so that you can decide definitely which patients can stand a one stage procedure, I ask you to be routinists and to do a preliminary operation in cases of large cancer of the bowel.

DR. CHARLES G. MINTER, Boston I should like to say a word about the neglected class of cases—the advanced, perforated lesions, with particular reference to the right colon.

Körte in 1913 analyzed over 200 cases and reported 7 per cent with perforation. In 1931, Bagen and Cox, reporting on 1500 cases, found 9.4 per cent with perforation. Some years ago we analyzed 73 cases at the Beth Israel Hospital in an attempt to find the reason for our high postoperative mortality. We found that 25 per cent of our cases showed perforation with either a large mass, abscess or internal fistula. Those cases, of course, represent the advanced stage. If you can drain the abscess and divert the fecal stream, it is sometimes remarkable what regression in growth takes place.

The first stage is drainage of the abscess—at the second stage I prefer a lateral ileotransverse colostomy made in the antiperistaltic direction and done through an incision on the left side of the abdomen. At the third stage, the second procedure will have had two effects: vaccination of the abdominal cavity on the right, and the formation of a barrier by postoperative adhesions with the root of the terminal mesentery, so that this portion of the abdomen is well protected. At resection during the third stage, a wide excision around the persisting fistula through the abdominal wall should be made. Further resections may have to be done, such as removal of a portion of the duodenal or gastric wall.

If the anastomosis is done in the antiperistaltic direction, there are two methods of procedure: the ends can be turned in, or if that seems to leave too long a blind loop, or if there is danger of opening the left side of the abdominal cavity, a closed type of Mikulicz can be done and the spur cut down, and later on closure of the fistula can be done in the wound. The lumen does not have to be large, as an adequate anastomosis has already been established by ileotransverse colostomy.

In the current year we have handled 3 such cases with out mortality. Of our last 6 cases, 5 have survived. The one fatality was an ill-advised attempt at one stage resection.

A case has recently come to my attention, that of a woman on whom I operated some years ago. A multi-stage resection was done, with removal of part of the duodenal wall and the perinephritic capsule. The woman

lived an active life for three and a half years or more, and died of uremia from recurrence in the right renal region. I feel that such a result gives a little encouragement for more intensive operative procedures on the late cases

DR PHILEMON E TRUESDALE, Fall River I should like to make one point in connection with anastomosis of the large intestine. Bearing in mind that the sphincter muscle of the anus is a shut-off valve, and that the afferent loop of intestine empties on the surface of the abdomen, the

contents of the bowel will pass in the direction of least resistance, which is through the colostomy. This opening will not close until the obstruction at the anus is removed. If the sphincter is cut or temporarily paralyzed by dilatation, closure of the colostomy will be greatly facilitated. In all anastomotic operations on the large intestine, I think it is wise to paralyze the constrictor muscle temporarily either by dilatation or by severing the external sphincter muscle, just as we do in operating for anal fistula.

A NEW CONCEPTION OF SERUM PHOSPHATASE

Review of Experimental Work

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JEROME GRATTAN, M.S.§

BOSTON

IN 1930 Roberts¹ reported an increase in serum phosphatase values in obstructive jaundice, subsequently he suggested that the phosphatase level could be used in the differential diagnosis of jaundice on the basis of there being a high value in the obstructive type and a low value in the hepatocellular type. Numerous studies of phosphatase in jaundice have been made during the past few years, and the material is well reviewed by Cantarow.³ Briefly, the present status of the subject is as follows. Numerous workers have confirmed the fact that extrahepatic biliary obstruction causes a rise in serum phosphatase both in human beings¹ and in dogs.⁵ But there is a great difference of opinion as to whether hepatocellular jaundice yields uniformly low values. Cantarow and Nelson⁶ in 1937 concluded that phosphatase determinations are of no value in differentiating these two types of jaundice, since high values are found in cases of hepatocellular jaundice caused by a proved toxic etiology. Flood, Gutman and Gutman⁷ in the same year, however, stated that the method is useful, inasmuch as a low phosphatase value definitely rules out obstruction of the extrahepatic biliary tree.

No logical explanation of the high phosphatase values in obstructive jaundice has yet been offered. Cantarow and Nelson⁶ write "It seems futile in the present state of knowledge to theorize regarding the possible mechanism of production of the increase in serum phosphatase in jaundice of obstructive and hepatocellular origin."

The purpose of this paper is to attempt an explanation of the mechanism involved, and to summarize for the clinician the essential facts of a

series of rather complicated experiments which have recently been reported in extenso elsewhere.^{8, 9, 10, 11, 12.}

EXPERIMENTS

The Activation of Serum Phosphatase with Ascorbic Acid Commencing with the fact that ascorbic acid was known to act as an activator or catalyst in proteolytic enzymatic reactions,^{13, 14} a series of test-tube experiments was performed to

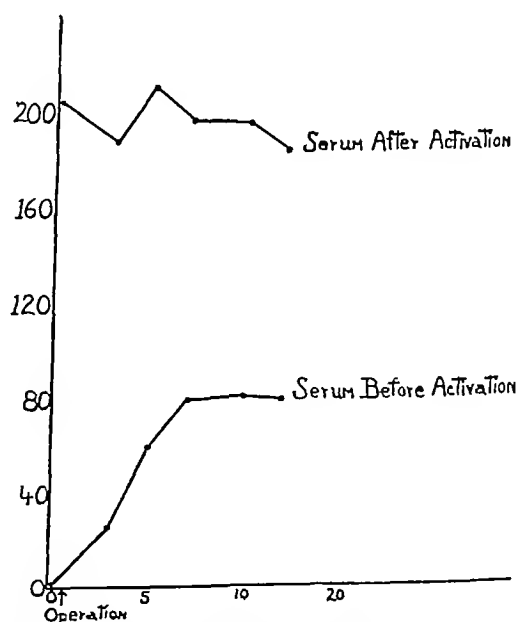


Figure 1 Serum phosphatase values after common bile duct ligation, before and after activation

determine whether this effect might also be operative on the enzyme of serum phosphatase. It was found that ascorbic acid was an intense activator of serum phosphatase. After a large number of tests had been done, the optimal conditions were determined as a proportion of 5 mg. of ascorbic acid to 1 ml. of serum.

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bic acid to 0.1 cc of blood serum, using β -glycerophosphate at a pH of 8.9 as a substrate. The activation was immediate, and showed no increase after the first hour. Accordingly, all readings were made after one-hour incubation at 37°C and all subsequent tests were made under the optimal conditions defined above. Numerous tests showed that normal human, dog or cat serum on activation contained from one hundred to two hundred times as much phosphatase as had ever before been suspected. The phenomenon of activation by ascorbic acid was then used to study pathologic human serums and those of animals under various controlled experimental conditions.

Experimental Biliary Obstruction Beginning with the simplest experimental situation, the common bile duct was ligated in 11 dogs, and blood samples were studied at frequent intervals. In each instance the serum phosphatase level rose steadily, and in from ten to fourteen days reached a maximum of 80 to 100 units,* as previously described by Bodansky and Jaffe.⁵ When the serum from these dogs was activated with ascorbic acid, instead of the two-hundred-fold increase in activity noted in normal samples the values rose only to the general level procured by activation of the preoperative sample. A typical experiment is shown in Figure 1. The serum before common bile duct ligation showed 125 units, which on activation with ascorbic acid rose to 205 units. On the seventh postoperative day the dog's serum contained 80 units by the ordinary test, and on activation with ascorbic acid the value rose to 197 units. This indicated that the rise in phosphatase noted after biliary obstruction was due to an increased activation of the serum phosphatase, and not to an actual increase in the amount of circulating phosphatase, as had always previously been supposed. If there had been an actual increase in amount of phosphatase the value on activation should have increased from 80 to 1600 units. It was thus evident that retention of bile caused the increased activation, but the identity of the activator was unknown.

Effect of Parathyroidectomy on Blood Phosphatase in Biliary Obstruction In order to determine the possible influence of parathormone, so evident in osteitis fibrosa cystica, on the activation of serum phosphatase, an experiment was performed in which ligation of the common bile duct of a dog was combined with complete thyroparathyroidectomy. This animal showed the typical syndrome of parathyroid deprivation. Tetany was prevented

by the intravenous administration of calcium gluconate. The rises in serum phosphatase were in the same order of magnitude as those noted in bile duct obstruction alone. Activation of the serum with ascorbic acid showed a response which was also identical. It seemed justifiable to conclude from this experiment that the parathyroid glands are not necessarily involved in the production of high phosphatase value, and do not enter in any obvious manner into the equation in biliary obstruction (Fig 2).

Experimental Complete Biliary Fistula So as to study the behavior of serum phosphatase under conditions just the reverse of biliary obstruction, a

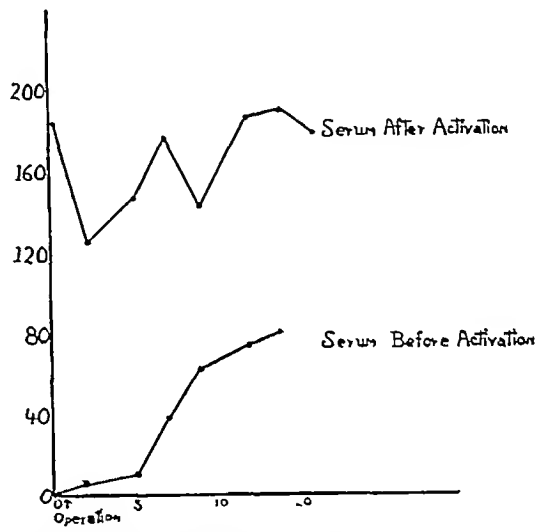


Figure 2 Serum phosphatase values, after common bile duct ligation and thyroparathyroidectomy, before and after activation

series of 12 dogs with a biliary fistula was prepared. In these animals the common bile duct was ligated and a mushroom catheter was inserted into the fundus of the gall bladder. The end of the catheter was brought out through a stab wound in the abdominal wall and connected to a sterile balloon. It was thus possible to collect all the bile excreted each day, and to study its phosphatase content, as well as that of the blood serum.

The serums of these animals gave the surprising result of an increase in phosphatase to from twenty to thirty times the normal preoperative level within two or three days after operation. On activation of the serum with ascorbic acid the same phenomenon noted with obstructed dogs occurred, that is, the increase in activity was limited to the level found before operation. This indicated that the increase in serum phosphatase after biliary fistula was also due to an activation of the enzyme, and not to an increase in the total amount of phosphatase (Fig 3).

In order to avoid repetition the term unit throughout this paper is used to designate the Bodansky unit. The latter is that amount of phosphatase contained in 100 cc of serum which will hydrolyze 1.0 mg of phosphorus from the substrate β glycerophosphate at a pH of 8.9 at 37°C. in one hour.

The Phosphatase Content of Bile Bile taken from the gall bladders of normal dogs was found to contain from 25 to 55 units of phosphatase per 100 cubic centimeters. Daily determinations of bile from the dogs with a biliary fistula showed no significant variations from the normal amount, nor did the general condition of any dog vary greatly during the course of the experiment. When



Figure 3 Serum and bile phosphatase values, in cases with complete biliary fistulas, before and after activation

ascorbic acid was added to these bile samples, very little increase (about 20 per cent) in phosphatase activity was found, indicating an almost complete activation of gall-bladder bile at all times. It thus seemed that the bile contained the activating substance.

The Effect of Ascorbic Acid on the Activation of Human Serums with High Phosphatase Activity With the purpose of studying the degree of activation of the serum phosphatase in human beings, ascorbic acid was added to the serums of normal individuals and to those of patients with high phosphatase values. It was found that normal serums responded with an increase in activity up to from 100 to 135 units. The serums with high initial values failed to show such striking rises. For example, in 1 case of Paget's disease the initial value was 48 units, and on activation with ascorbic acid rose only to 105 units. These results indicated that in diseases showing high serum phosphatase values the situation is the same as in the experimental animals, that is, one of increased activation of phosphatase, and not an actual increase in the total amount of the enzyme present in the serum.

The Effect of Bile Acids on Serum Phosphatase Activity In an effort to determine the role played by the bile acids in the rise of serum phosphatase

in biliary obstruction, a series of experiments was performed *in vitro*. It was found that the addition of sodium desoxycholic acid produced a marked inactivating effect on serums with high phosphatase values. This inactivating property of bile acids on phosphatase had previously been noted by Takata.¹⁵ It had also been known since 1933 that other substances containing the sulphhydryl (SH) radicle had a similarly depressing effect on phosphatase activity.¹⁶ Experiments *in vitro* with glutathione and cystein showed that these substances had an inactivating effect on phosphatase which was much greater quantitatively than the effect of ascorbic acid as an activator. Experiments *in vivo* with dogs and patients suffering from Paget's disease showed that the intravenous injection of cystein brought about a temporary drop in the serum phosphatase. It was not possible to bring about changes of the magnitude observed in the test-tube experiments, but a definite temporary decrease in phosphatase values was noted.

The important feature of these experiments was the demonstration that the effect of retained bile acids was a lowering of the phosphatase activity, while dogs and human beings with complete biliary retention showed an increase in phosphatase activity in the blood. This finding pointed to the existence of some other substance in the body which activates the phosphatase in the serum, and which must be present in sufficient amounts to overcome easily the effect of bile acids. This assumption of the existence of an activating substance also reconciled the seemingly paradoxical increase in phosphatase in dogs with a complete biliary fistula. In these experiments the draining off of bile acids resulted in a predominance of the activating factor.

The Nature of the Activating Substance The nature of the activating substance may be assumed to be analogous to the coenzyme systems already described by Warburg,¹⁷ von Euler,¹⁸ Kuhn,¹⁹ Meyerhof,²⁰ and others. These investigators have demonstrated the existence of a cozymase which enters into the reaction in the carbohydrate metabolism of muscles.

According to Warburg¹⁷ and von Euler,¹⁸ the cozymase in this system is a definite crystalline chemical compound consisting of a combined phosphoric ester of the amide of nicotinic acid, a pentose and phosphoric acid.

The exact nature of the cofactor or coenzyme in the serum phosphatase reaction has not as yet been determined. Certain additional facts about it, however, are known. In recent experiments²¹ it has been demonstrated that the addition of 0.1 cc of serum from dogs with biliary obstruction or from patients with Paget's disease to 0.5 cc

of normal serum will cause an increase in the splitting of phosphates of from 200 to 400 per cent. In other words, the pathologic serums contain a substance which has the same activating power as ascorbic acid, but differs inasmuch as its maximal effect is not reached until after twenty-four hours of incubation. Ascorbic acid reaches its maximum in one hour. The activating substance or cofactor can be demonstrated in dialysates of the serum from dogs with biliary obstruction.

DISCUSSION

The most significant conclusion of clinical import that can be drawn from all these experiments is that what has always been regarded as an increase in amount of serum phosphatase in disease is not an actual increase in enzyme, but merely an activation of pre-existing enzyme normally present at all times and in all the animals studied. This necessitates an alteration in our fundamental concept of phosphatase in both normal and pathologic states. The relation of serum phosphatase and bone phosphatase to the growth and repair of bone may well be involved.

It is doubtful whether the discovery of substances such as cystein or glutathione which depress phosphatase activity will be of any practical use in the treatment of Paget's disease, and of other conditions known to have high phosphatase values in the serum. Careful studies on a patient with osteitis fibrosa cystica from whom parathyroid adenomas had been removed surgically were made by Bauer.²² By following the serum calcium-phosphorus ratio and the phosphatase after operation, together with biopsies of the bone, Bauer found that the serum phosphatase remained elevated postoperatively until all evidence of osteoblastic activity had ceased. He concluded that the high phosphatase was an index of osteoblastic activity, and as such was a normal physiologic concomitant of bone-building. If this theory is correct it would be unwise to attempt to lower the phosphatase artificially in Paget's disease, since it might interfere with reparative processes. But this raises the fundamental question of which is primary and which secondary.

The mechanism of increased serum phosphatase in jaundice seems to be understandable in the light of the results given here. Any obstruction to the excretion of bile results in the damming up of both depressing (bile acids) and activating (cofactor) substances. Since the cofactor is more powerful as an activating agent than bile acids are as depressors, the net result is an increase in activity of

serum phosphatase. The difficulty of attempting to use phosphatase determinations in the differential diagnosis of liver disease is thus apparent.

It has been shown in these experiments that phosphatase activity must represent the outcome of reactions in a complex system consisting of enzyme, cofactor, oxidation-reduction potential and substrate. Thus the phenomenon is analogous to the cozymase system described by Warburg and von Euler. Our experiments demonstrate that human disease may originate from disturbances in enzymatic activity either from a deficiency or from an excess of any of the factors in the system.

CONCLUSIONS

Elevation in serum phosphatase as seen in clinical and experimental pathologic conditions is due to an increased activation, and not to an actual increase in the amount of this enzyme present in the circulating blood. This increased activation results from the presence of a coenzyme, the exact nature of which has not as yet been determined.

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PAPERS FROM THE FAULKNER HOSPITAL

THE USE OF COMBINED PONTOCAINE AND NOVOCAIN
FOR SPINAL ANESTHESIA

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BOSTON

FOR the past four years at the Faulkner Hospital, pontocaine and novocain have been combined for spinal anesthesia in 1500 cases to the exclusion of all other agents. This practice followed the experiences of Lundy and Essex of Tovell and of McCuskey, who advocated this combination for anesthesia below the level of the umbilicus. This method has apparent advantages of safety and efficiency which our use of spinocain, novocain and pontocaine separately had not given since the return of spinal anesthesia in surgery in 1928. In our hands pontocaine-novocain anesthesia has been highly satisfactory, and thus far no fatalities have been directly attributable to it.

Spinocain was discarded in 1929, after a year's trial, as too depressing to the circulatory and respiratory systems, and also as unreliable in the development of anesthesia. Novocain crystals dissolved in spinal fluid were used in doses of from 50 to 300 mg. until 1933. It was difficult to obtain anesthesia lasting from one to two hours with novocain alone, however, and the incidence of nausea and vomiting was considerable, with an initial drop in blood pressure in the large majority of cases. In 1932 pontocaine alone was tried. While the anesthesia thus gained was satisfactory in depth and duration, with minimal disturbance of the clinical course, there were definite drawbacks: anesthesia did not invariably follow its injection, the level of anesthesia not infrequently fell short of one's expectation, the onset of anesthesia was often delayed from five to twenty-five minutes, and complete sensory anesthesia was not obtained in all cases. In a few cases sudden respiratory failure developed.

The specific gravity of the combination of pontocaine and novocain with the spinal fluid is definitely greater than the specific gravity of the fluid itself, as is shown clinically by the fact that anesthesia develops in the dependent side of the patient as he lies on the table after the injection.

In terms of the anesthetic effect, 1 mg. of pontocaine used alone is said to be the equivalent of 10 mg. of novocain. But when pontocaine and novocain are used in combination the anesthetic effect is actually different. For example, 200 mg. of novocain will give sufficient anesthesia for a

gall bladder operation lasting up to one hour, but 10 mg. of pontocaine mixed with 100 mg. of novocain (which according to the above equivalents should equal 200 mg. of novocain) will give skin anesthesia only to about the level of the lower ribs, which is sufficient for a hysterectomy or appendectomy. Twenty mg. of pontocaine alone (theoretically equal to 200 mg. of novocain) will give anesthesia to the level of the clavicle, which permits operations in the upper abdomen lasting one and a half or two hours. Anesthesia of the same level and duration is, however, produced by 14 or 18 mg. of pontocaine in combination with 100 mg. of novocain (see Table 1), and with fewer toxic symptoms than would be produced by the 200 mg. of novocain which we have used as a standard of comparison. These facts indicate that the combination of the two agents in spinal fluid, through some synergistic effect not as yet clearly understood, reduces their toxicity, and produces a slighter fall in blood pressure than does either agent alone, less nausea and vomiting than does novocain alone, and less interference with respiration than does pontocaine alone. The combination, then, enhances the desirable effects of each drug, and avoids the major disadvantages of either used singly.

The onset of anesthesia with the pontocaine-novocain mixture is approximately as rapid as that with novocain alone, varying from one and a half to five minutes. The desired level of anesthesia governed by the dose and technic of administration is gained within this period, and sensory loss is complete. The duration of the anesthesia is approximately the same as that gained with pontocaine alone, or twice that gained with a comparable dose of novocain alone.

CONTRAINDICATIONS

This method of spinal anesthesia has been employed in all types of operations below the diaphragm, in well-selected cases. The chief contraindications to its use are the same as are recognized in general for spinal anesthesia, namely markedly debilitated states caused by acute or chronic disease, shock, hemorrhage and sepsis, hypotension of pathologic origin, hypertension with cardiac or renal disease (contraindicates high spinal anesthesia only), severe cardiac conditions (contra-

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indicates high spinal anesthesia only), vertebral disease (prevents lumbar puncture), and local sepsis at the site of the lumbar puncture. There are no general contraindications to this method of spinal anesthesia for operations requiring only 50 mg of novocain and 5 mg of pontocaine, or less.

PREPARATION OF THE PATIENT

The night before operation the patient should receive some form of hypnotic to produce a good night's sleep, such as 3 gr pentobarbital-sodium, with a glass of orange juice at 8 o'clock. Two hours before operation this dose of pentobarbital-sodium is repeated. One-sixth grain morphine sulfate and 1/200 gr scopolamine are given one hour before operation to the average patient. These dosages must be varied according to the age, sex, weight, and psychic and physical condition of the patient. The patient should arrive at the operating room in a very drowsy, amnesic state.

TECHNIC OF ADMINISTRATION*

For the administration of anesthesia with pontocaine and novocain, the variable factors to be considered are the site of injection, the dilution of the agents in the spinal fluid, the dosage to be employed, the rate of injection, the position of the patient and the supplementary anesthetic measures.

Site of Injection. The second to third lumbar interspace is used almost routinely for injection. In lower-extremity operations or operations below the umbilicus in poor-risk patients, the third to fourth lumbar interspace is chosen. If the patient is in good physical condition and there is difficulty of puncture at the second to third lumbar interspace, the first to second interspace may be used.

Dilution of Agents. The concentration of the pontocaine and novocain in solution with the spinal fluid is of great importance in lessening the toxic effects. The greatest danger in spinal anesthesia is the use of highly concentrated solutions of the agents. The dosage of the agents should be kept at a minimum considering the individual's physical condition and the type of operation. The dilution of the mixture with spinal fluid is based on an allowance of 1 cc of spinal fluid for each 50 mg of novocain.

Dosage to be Employed. To simplify the estimation of dosages, 50 mg of novocain is now used, with varying dosages of pontocaine to obtain height and duration of anesthesia, for operations below the level of the umbilicus, and 100 mg of novocain,

with varying dosages of pontocaine, to obtain anesthesia above the umbilicus (Table 1). The age, size and physical condition of the patient, as well as the type and approximate duration of the operation, are considered, and postoperative pain is also allowed for. If the calculation of the dosage of pontocaine and novocain is based on the average-sized adult, 10 mg of pontocaine with 100 mg of novocain gives anesthesia to the nipple line, lasting for two and a half or three hours in the superficial structures, as in double herniotomy. These dosages are insufficient to give anesthesia for the deeper structures, in which pain is conditioned by

Table 1 *Standard Dosages for Normal Adults as Used at the Faulkner Hospital*

OPERATION	NOVOCAIN mg	PONTOCANE mg	AVERAGE TIME OF ANESTHESIA		SPINAL FLUID cc
			DEEP STRUCTURES hr	SUPERFICIAL STRUCTURES hr	
Hemorrhoids dilatation and curettage pro- state, perineal repair deliveries	50	5-8	1 ¹	2	1.0
Cesarean section hernia (single)	50	8-10	1	1 ¹	1.5
Hernia (double) ne- phrectomy	100	10	2	2 ¹ 3	2.0
Appendectomy	100	8-10	1 ¹	1 ¹ 2	2.0
Gall bladder stomach intestines	100	14-18	1 ¹	2 ¹	2.0
Hysterectomy	100	12	1 ¹ 2	2	2.0
Lower extremities	50	5	1 ¹	2	1.0
	50	10	2	2 ¹	1.0

nerves at higher spinal levels and by sympathetic nerve plexuses. For the anesthesia of deep structures, such as the gall bladder and stomach, 12 to 14 mg of pontocaine in women and 14 to 18 mg in men is required with 100 mg of novocain. This mixture will give an anesthesia duration of from one and a half to two hours.

Rate of Injection and Position of Patient. In the administration of this combination only slight variation from standard methods has been made. Induction of anesthesia is made with the patient on his side, the operating table level and the head on a small pillow. Ephedrine sulfate (50 to 100 mg in 1 to 2 cc of 1 per cent novocain) is injected subcutaneously into the second to third or third to fourth lumbar interspace level. Lumbar puncture is then performed with a 22-gauge gold needle, introduced through a Mason thumbtack introducer. In accordance with the dosage chart the proper amount of spinal fluid is withdrawn into a 10-cc syringe, the novocain crystals are dissolved by this fluid, and the proper amount of pontocaine is added. This combination is injected without barbotage into the subarachnoid space at a rate of 0.5 cc per minute. As soon as the injection is completed the patient turns himself so that he is lying on his back, keeping his head on the pillow. This maneuver facilitates the diffusion of the pontocaine-novocain solu-

*The present technique of administration and the dosage chart differ somewhat from those given by the author in Chapter VI of *Mason's Preoperative and Postoperative Treatment* (Philadelphia: W. B. Saunders Company 1957).

tion in the spinal canal. In order to prevent any possibility of the spinal agents' working cephalad, the Trendelenburg position is not allowed for fifteen minutes. The blood pressure, pulse and respirations are recorded every five minutes. If the diastolic blood pressure approaches 20 mm of mercury, 0.2 cc adrenalin (1:1000) is injected intramuscularly to maintain or elevate the pressure. If the fall in blood pressure is due to surgical shock from loss of blood, 5 per cent glucose in saline is given intravenously, with a citrated blood transfusion in addition if the condition requires it.

Supplementary Anesthetic Measures Spinal anesthesia must be supplemented by other technics if the operation extends beyond the duration of the anesthesia, or if the patient is a borderline operative risk.

If the operation is protracted, so that the anesthesia wanes, the earliest signs of pain or discomfort or of spasm of the abdominal muscles demand that the anesthesia be supplemented by cyclopropane or nitrous oxide and oxygen. Sufficient ether is then added to obtain adequate relaxation, but the addition should be made with caution. Unless complete oxygenation is assured, it is dangerous to supplement spinal anesthesia with a deep nitrous-oxide and oxygen anesthesia, or to add ether hastily to this mixture in the first half hour, since anoxemia may be produced with resultant respiratory paralysis.

If the patient is a borderline operative risk requiring an upper abdominal or prolonged intra-abdominal operation—cholecystectomy or resection of the stomach or rectum—the dose should be kept at a minimum, not to exceed 10 mg pontocaine and 100 mg novocain. In the borderline-risk patient the attaining of complete height and duration of anesthesia by means of larger doses should not be attempted. The spinal anesthesia should instead be at once supplemented with cyclopropane and oxygen, which may be in turn supplemented by ether and oxygen (500 cc per minute), administered by the carbon-dioxide absorption technic throughout the operation. Nitrous oxide may be used in place of cyclopropane. After the peritoneum has been closed the inhalation anesthetics are completely removed and 100 per cent oxygen is administered, with re-breathing. The large majority of patients almost regain consciousness, with reflexes well established, before leaving the operating room. Postoperatively there is little nausea, vomiting or restlessness, and no untoward complications. The results in the cases handled by this method have been highly gratifying. This technic gives the surgeon the benefit of the complete relaxation of a maximum high spinal anesthetic through the use of minimum doses of pontocaine and novocain, with complete control of the

patient's oxygenation, and of a minimal amount of ether.

POSTOPERATIVE CARE

We believe that the immediate postoperative care should be under the control of the anesthetist just as is the care before and during the operation. The patient is kept level in bed for three hours, the head of the bed is then slowly elevated to a 30 degree angle. For the more effective prevention of pulmonary complications, the nurse is instructed to turn the patient from one side to the other every hour, and to have him inhale slowly and exhale rapidly twelve times on awakening. The blood pressure is recorded every fifteen minutes for three hours, or until it maintains itself at a normal level. Unless contraindicated, 500 cc. of 5 per cent glucose is given by rectum at once and 250 cc of saline is given rectally every four hours until the patient is able to retain fluids by mouth. If it is desirable to give a hypodermoclysis, the anesthetized legs are a very satisfactory site. Patients in poor physical condition are given from 750 to 1000 cc of 5 per cent glucose intravenously after the induction of anesthesia, during the operation, or immediately after it. The injection of intravenous fluid may be repeated every six or eight hours, a citrated blood transfusion may be added if necessary.

SUMMARY

Pontocaine and novocain in combination have been used exclusively in spinal anesthesia at the Faulkner Hospital during the past four years, the total number of cases so anesthetized being 1500. No fatalities directly attributable to the spinal anesthesia have occurred. Whereas each of these drugs used alone in spinal anesthesia has certain undesirable effects, the combination minimizes the disadvantages of each and enhances the desirable features of both.

The technic of management of patients undergoing spinal anesthesia is described.

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THROMBOANGIITIS OBLITERANS OF THE SPERMATIC CORD

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BOSTON

CASE REPORT

THROMBOANGIITIS obliterans has, from Buerger's¹ earliest publications, been considered very largely a disease of the extremities. This emphasis reached a degree that justified many reports in which it was attempted to prove that the disease involves the general vascular tree. This contention, however, had not originally been denied by Buerger. He says by way of definition "At the onset, thromboangitis obliterans is essentially an inflammatory process, involving particularly the deeply situated and larger arteries and veins of the lower and upper extremities." However, he further states "Although no extensive study has been made of thromboangitis in the vascular domain outside of the extremities, the typical lesions have been observed by the author in the spermatic vessels, and according to Murphy are said to occur in the renal vessels." Among the earliest supporters of this view, Barron and Linenthal² came to the following conclusion "This disease is not confined to vessels of the extremities, as is generally accepted, but is a generalized disease which may affect any part of the arterial tree, including the coronary arteries, the abdominal arteries and the arteries of the brain." Birnbaum, Prinzmetal and Connor³ described a case with very extensive dissemination of lesions, including the suprarenal, retinal, cerebral, pulmonary, coronary, mesenteric, pancreatic, hepatic, renal, duodenal and prostatic vessels. Excellent discussions of coronary-vessel involvement have been published by Mallory⁴ and Eppinger.⁵

In 1928, McGregor and Simson⁶ published a very illuminating report. Their patient was a Russian Jew, aged twenty-eight, who proved to have thromboangitis obliterans of the left spermatic cord. An orchidectomy was done, and the microscopic sections afforded an excellent opportunity for studying the early acute form of the disease. We wish to stress that surgery in cases of Buerger's disease of the spermatic cord affords an excellent opportunity of obtaining uncontaminated material for investigative work. It is for this reason, and for the purpose of directing attention to a lesion which is not considered in the differential diagnosis of diseases of the spermatic cord, that this report is made.

A Russian Jew, aged 28, presented symptoms of a dragging sensation and tenderness in the left groin and the left half of the scrotum, of less than 4 weeks' duration. There had been a gradual onset of the dragging sensation, which was later accompanied by tenderness. These discomforting symptoms soon became incapacitating. General good health continued, however, and the patient suffered neither chill nor temperature elevation. There were no abdominal manifestations or genitourinary symptoms.

The patient had been an habitual user of tobacco to excess in the form of cigars and cigarettes since early adult life. The past history was otherwise negative. All possibility of venereal disease was denied.

The patient's father and mother, both in the 7th decade, had hypertensive heart disease and diabetes, respectively. His wife and two children were alive and well. One sister of middle age was in good health and one brother, aged 32, was under treatment for duodenal ulcer. Another brother had died several years previously at 29, with a clinical diagnosis of acute coronary disease.

Physical examination revealed a generally well person with normal pulse and temperature. Locally there was moderate tenderness of the left spermatic cord, and a palpable mass the size of a cherry in the cord about 1 cm above the epididymis. The testis and epididymis felt normal and were non-tender. The cord above the nodule mentioned presented no tenderness, and there was no suggestion of thickening or induration. No difficulty was encountered in isolating the ductus deferens. The right cord, testis and epididymis were normal, and there was no involvement of the tissues of the scrotum. The prostate was normal to palpation.

The white-blood-cell count was 6350 with 75 per cent polymorphonuclear neutrophils, 1 per cent eosinophils, 1 per cent monocytes and 23 per cent lymphocytes. The red blood-cell count was 5,200,000 with a hemoglobin of 108 per cent (Sahli), the blood smear was normal. Examination of the urine was essentially negative. A blood Hinton test gave a negative reaction.

Under general anesthesia the mass was removed, it proved to be a matted segment of the pampiniform plexus and associated arteries. The testis and epididymis and the cord above the involved area were normal in appearance. The mass was adherent to the ductus deferens, but separation was effected without difficulty.

Convalescence was uneventful, and there was no residual induration of the cord. On two occasions, however, after periods of sexual activity there has developed generalized edema of the scrotum and tenderness at the operative site. At the present time (2 months after operation) there is no suggestion of recurrence. Examinations have revealed no evidence of vascular disease in the extremities.

Pathological Report

Gross examination showed the specimen to be roughly ovoid, with irregular surfaces. It was of firm but pliable consistence, white, and measured 1.5 by 1 by 0.6 cm. Sectioning revealed a moist, glistening, white to grayish white

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cut surface with scattered small purplish red and brownish areas 0.5 mm or less in diameter.

Microscopic examination revealed veins varying from 0.3 to 1.3 mm in diameter, with occluding lesions. Only arteries less than 0.17 mm in diameter (arterioles) were present. The smaller vessels, including the arterioles, presented patent lumens and normal lining surfaces and vessel walls.

Characteristic lesions were found in a zone within the vessel lumen, adjoining the lining surface and apparently replacing the intima. These consisted of focal accumulations of mononuclear cells and frequent giant cells of foreign body type (Fig. 1), often with abundant cyto-



Figure 1 A zone of mononuclear cells focally arranged and with foreign body giant cells lines the intimal surface of a vein. On the left is a thrombus infiltrated with polymorphonuclears and on the right the vein wall. 200X.

plasm and fairly evenly distributed nuclei. These foci blended with each other, in some instances so as completely to line the vessel lumen. No necrosis was evident in these cell collections in any location. In several places the thrombus in the central portion of the vessel revealed disintegration of the fibrin and collections of polymorphonuclear neutrophils and fragmented nuclei. Other occluding masses were formed of partly organized thrombi, or organized and partly canalized thrombi with an occasional giant cell of foreign body type near the margin (Fig. 2). Of the 36 cross-sections examined, 3 showed healed lesions as last described. Clumps of hemosiderin were deposited here and there in the connective tissue.

The media of the veins were infiltrated in most instances by numerous polymorphonuclear neutrophils and varying numbers of eosinophils. No necrosis of the smooth muscle was present. Verhoeff's special stain showed the elastic tissue to be unaltered. The intervascular stroma presented an increase in connective tissue and was infiltrated by fairly numerous eosinophils and some polymorphonuclear neutrophils and lymphocytes in patchy distribution. The latter in places were clustered about small venules. Scattered clumps of hemosiderin were present. No tubercle-like lesions and no zones of necrosis were found in this intervascular zone. Sections stained for *Mycobacterium tuberculosis* and by the MacCallum and Goodpasture, and Gram-Weigert methods revealed no bacteria. Tissue properly fixed for the Levaditi stain was unfortunately not available.

Tissue fragments cultured in blood bouillon showed no growth.

Diagnosis: thromboangitis obliterans of spermatic cord.

The most typical histologic lesions in the section are focal accumulations of mononuclear cells with giant cells of foreign-body type in the vessel lumen and with purulent foci in the associated thrombi. Mallory¹ has pointed out that the cells forming the focal accumulations are prone to be arranged in perpendicular rather than concentric fashion as seen in typical tubercles. Both tuberculosis and syphilis are extremely apt to produce tubercle-like lesions outside the vessel wall. No zones of caseous necrosis as found in tuberculosis are evident in any focal mononuclear accumulation. The areas of infarct necrosis so often occurring with syphilis are not found, and no obliterative endarteritis is evident in the small vessels. In

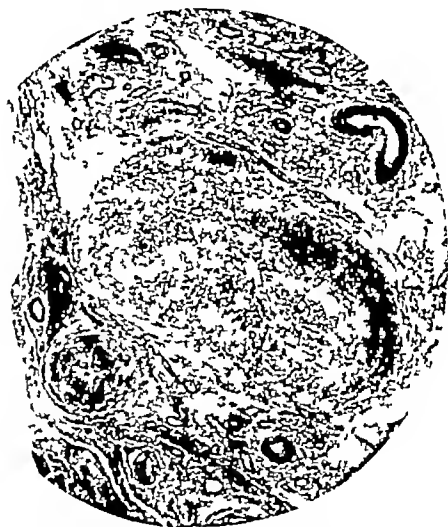


Figure 2 A vein lumen is obliterated by an organized partly canalized thrombus. A foreign body giant cell is present near one margin of the occluding mass. 45X.

thrombosis of nonspecific type, a thrombus appearing as described may occur, but in no such case is a tubercle-like lesion likely to be found in the vessel lumen. Sarcoid (Boeck's disease) would be likely to produce tubercle-like lesions outside the vessel wall. In view of the above considerations a diagnosis of thromboangitis obliterans seemed warranted.

DISCUSSION

Thromboangitis obliterans must be included in the differential diagnosis of diseases of the spermatic cord. The entity with which it is most likely to be confused is tuberculosis of the epididymis and ductus deferens, because of the latter diagnosis, in cases reported by Buerger¹ and McGregor and Simson,⁶ orchidectomy was performed. Chronic gonorrheal epididymitis and funiculitis

would prove difficult to differentiate clinically, and the diagnosis might depend on the demonstration of the characteristic intraluminal lesions of thromboangitis obliterans. Nonspecific thrombosis of the spermatic venous plexus would produce a considerably more extensive lesion than the one which was encountered. Benign and malignant neoplasms and the common spermatocele, hydrocele of the cord and varicocele should cause little confusion.

Unfortunately, there is no precedent on which to base an opinion as to prognosis. None of the few cases reported in the literature were followed long enough to indicate their course. If a parallel is to be drawn between the disease in the cord and in the lower extremities, some extension along the course of the pampiniform plexus and its associated arteries may be expected. By the same analogy, the development of similar lesions in other vascular beds might be anticipated. One report⁶ raises the possibility of gangrene of the testis, but this is doubted since deliberate section of the cord in hernioplasties, as done on the senile, is followed by progressive atrophy of the testis but not by infarct necrosis. The collateral circulation derived from the scrotal sac is adequate to protect the organ.

Therapy, on the basis of the pessimistic outlook in regard to recurrence⁴ in the spermatic cord, should consist in complete removal of testis and cord if the diagnosis is established before or at the time of operation. If, as in this case, local removal is carried out for biopsy purposes, any secondary procedure indicated because of residual tissue or

recurrence should be radical, that is, orchiectomy. Since the relation of localized lesions to distant development of the disease is not known, even this more radical treatment might fail to halt the progress of the malady.

The measures used in the treatment of conventional thromboangitis obliterans are largely directed toward increasing circulation, but in the localization of the disease considered here this method has little to offer. Total abstinence from tobacco is advisable as a possible preventive measure.

SUMMARY

- 1 A case of thromboangitis obliterans of the spermatic cord is reported.
- 2 Typical histologic lesions of the acute stage of the disease are described.
- 3 The importance of including thromboangitis obliterans in the differential diagnosis of lesions of the spermatic cord is emphasized.
- 4 Possibilities of prognosis and therapy are considered.

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CORONARY OCCLUSION IN A YOUNG ADULT

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THE last twenty years, and especially the last ten years, have seen a rapid development in the clinical diagnosis of coronary occlusion. A disease of vascular degeneration, it is encountered infrequently in patients below the age of forty, and rarely in patients below thirty.¹ Under such circumstances the clinician is tempted to doubt the logical conclusion reached after hearing the patient's story. He is apt to ascribe the accuracy of details to a previous knowledge by the patient of the condition in some other person, for lay knowledge of the disease has also spread widely. The electrocardiographic tracing may be of great value under these circumstances in confirming the diagnosis, which would otherwise be doubted because of the youthfulness of the patient.

Physician, Faulkner Hospital

Owing to the rarity of coronary occlusion in young people, it seems worth while to report a proved case.

CASE REPORT

Mrs. J. K., aged 28, entered the Faulkner Hospital on May 31, 1937, because of pain in the chest. On May 28, while sitting at a table, she was suddenly seized with pain in the middle of the front of her chest. The pain was severe and radiated to both shoulders, both arms, the upper back, the neck and both sides of the jaw. There was slight palpitation. She said that she felt as if she were going to die.

The mother was living and well at the age of 51, the father living and well at 53. Blood pressure determinations on the two in October, 1937, were 130/75 and 150/80 respectively. There was no evidence of vascular disease in other members of the family.

The patient had been a healthy young woman. Measles, chickenpox and whooping cough had been the only infec-

tuous diseases of childhood. A blood pressure reading of 145/90 was obtained at 21. During a pregnancy at 26 the tension varied between 130/80 and 160/90, with the majority of the readings 150/85. Only one of several specimens of urine examined during the pregnancy showed the slightest possible trace of albumin. The blood pressure was 145/90, 2 months after delivery. On May 14, 1937, when the patient consulted her physician because of pregnancy, the blood pressure was 150/85 and the pulse rate 96. Her last menstrual period had started on March 16.

Her physician saw her within an hour of the onset of pain. She appeared apprehensive and somewhat pale. The oral temperature was 98.6°F, pulse rate 80, respirations 16 and blood pressure 140/80. Examination of the heart, lungs and abdomen revealed nothing abnormal. Sedatives were given. The patient was carefully re-examined on the four following days. She continued so apprehensive of death as to seem hysterical at times. The oral temperature did not rise above 98.6°F, the pulse rate above 86 (and it went as low as 64), and the blood pressure varied between 135/75 and 125/70. The heart sounds were normal, without gallop or friction rub. Breath sounds on each side of the chest were normal. The lymph nodes were not enlarged, and the spleen was not felt.

Two specimens of urine had a specific gravity of 1.025 and 1.028 respectively, but contained large amounts of albumin. The hemoglobin was 90 per cent (Sahl), and the red blood cells numbered 4,500,000 per cu mm. The white blood cells were 32,000 per cu mm, with 6 per cent polymorphonuclears, 15 per cent lymphocytes, 1 per cent eosinophils and 78 per cent young cells resembling monocytes, which were mostly oxidase positive. There were 3 per cent nucleated red cells, and the platelets were slightly decreased. The blood Hinton reaction was negative.

Stereoscopic x rays of the chest with careful fluoroscopic examination of the mediastinum showed no abnormalities.

An electrocardiographic tracing made on June 1 showed a low take-off of the S-T curve in Lead 1, and a high take-off in Leads 2 and 3. The QRS complex was notched in Lead 2. T waves were diphasic in Leads 2 and 3. On June 2 the take-off of the S-T curve in Lead 1 was not so low as the day before. A tracing made from a chest lead, with the electrode at the apex, showed a Q wave.

The pain recurred occasionally throughout each day of the illness, though most of the time it was slight. On June 2 the patient was found distraught with pain, which eased in a few minutes, the patient lay back to rest. Twenty minutes later she was found extremely cyanotic and died promptly.

Autopsy examination by Dr. J. Beach Hazard confirmed the clinical diagnoses of acute myocardial infarction and leukemia.

The heart was enlarged, weighing 410 gm. The posterior half of the left ventricular wall was pale brownish-yellow from within 1 cm. of the mitral ring to the apex, and was thinned to 0.9 cm. as compared with 1.9 cm. elsewhere. There were mural thrombi in the right ventricle. Beginning 18 cm. from its origin, the right coronary artery had an eccentric thickening of its wall which reduced the lumen to about 0.1 cm. in diameter. The vessel was completely occluded by clot, beginning 4 cm. from the orifice. The clot extended into the transverse and descending branches. The left coronary artery had a marked diminution in size of lumen to 0.1 cm. for a distance of 0.6 cm. The transverse (circumflex) branch had a lumen only 0.2 cm. in diameter, but was smooth-walled throughout. Microscopic sections through the myo-

cardium of the left ventricle showed extensive areas of infarct necrosis, with an infiltration of moderate numbers of polymorphonuclear neutrophils in the vicinity. Microscopic sections of the right coronary artery through the occluding mass showed eccentric thickening of the vessel wall by an increase in connective tissue, the latter containing scattered islands of vacuolated macrophages. The thickening encroached to only a slight extent on the size of the lumen. Fanning off into the lumen from the surface of the thickening were alternate masses of fibrin, serum and platelets. This clot completely occluded the vessel. In the outer portions of the muscularis and in the tissues about the vessel there were a few scattered lymphocytes and occasional polymorphonuclear neutrophils. The lining surface of the aorta was yellowish white, with slightly elevated yellowish areas in places.

The kidneys weighed 180 gm. each and were negative, except for the microscopic finding of tubules distended with coagulated albumin. The spleen was enlarged, weighing 460 gm. The splenic pulp was rather soft, and gray to purplish gray. It was diffusely infiltrated by round cells, slightly larger than the adult lymphocyte, and with round and often slightly indented nuclei. There were occasional clumps of stem cells. The liver was also enlarged, weighing 2100 gm. Occasional branches of the portal vein were occluded by grayish brown and purplish brown masses of clot.

The marrow of the vertebrae and sternum was gray to greenish gray and slightly translucent. Marrow from the femur was very soft, almost semifluid in places, and varied from yellowish to grayish green. Microscopic sections showed markedly increased cellularity, especially of the vertebral and sternal marrow. The dominant cell was generally round but occasionally elongate or ovoid. The nuclei were round or slightly indented, with the chromatin often greatest near the nuclear margins. Myelocytic and polymorphonuclear eosinophils were scattered about.

Some mesenteric and retroperitoneal lymph nodes appeared slightly enlarged, but microscopically were negative.

A few branches of the pulmonary artery were occluded by clot, apparently of embolic origin.

This patient had carried a mild hypertension for years, but did not live an especially strenuous life. Her parents are living and well, and she was hardly of the group which one might expect to be peculiarly susceptible to terminal vascular disease.

The leukemia had no direct bearing on her death, so far as could be determined. The white blood cell count was not very high, the clot did not consist primarily of white blood cells, and the encroachment on the lumen of the coronary vessels was arteriosclerotic and not due to accumulated masses of leukemic cells. The presence of clots in branches of the portal vein suggests some increased susceptibility to the formation of thrombi but the cause of the susceptibility is not obvious.

3 Conway Street.

I am indebted to Dr. D. L. Lionberger for assistance in the care of the patient and for information from his records.

REFERENCE

1. Glendy, R. E., Levine, S. A. and White, P. D. Coronary disease in youth. *J. A. M. A.* 109:1775-1781, 1937.

CASE RECORDS OF THE FAULKNER HOSPITAL

Antemortem and Postmortem Records as Used in Monthly
Clinicopathological Conferences*

Directed by J BEACH HAZARD, M.D

CASE NO 6374

PRESENTATION OF CASE

An Irish American, aged seventy-four years, was admitted because of pain and vomiting

Fifteen hours before admission the patient began to have severe generalized abdominal pain, occurring in spasms at frequent intervals and associated with persistent vomiting. Vomitus at first consisted chiefly of food recently eaten and subsequently of apparently bile-stained fluid. These symptoms continued throughout the night. In the morning the spasms of pain became less, but the patient was aware of a sensation of soreness in the right lower quadrant, which became worse during the three hours previous to admission. Vomiting still occurred occasionally. The patient's bowels had moved several times during the night and once during the morning.

A large left inguinal hernia had been present for many years and had been rather inadequately helped by a truss. Occasionally it would become incarcerated and on several occasions it had been reduced with difficulty. For some years, also, there had been a vague complaint of "stomach trouble," which the patient usually ascribed to his hernia.

Physical examination showed a well-developed and well-nourished man. The temperature was 100°F., pulse rate 96, and respirations 22. The skin and tongue were clear. Examination of the head and neck was negative. The arteries showed a moderate degree of sclerosis, consistent with the patient's age. The lungs were clear. The heart was not enlarged, and no thrills or murmurs were present. The blood pressure was 130 systolic, 76 diastolic. The pulse was rapid, regular and of good quality. Extremities and reflexes were negative. The left external inguinal ring was distinctly dilated, and a definite impulse could be felt. The abdomen was slightly distended and showed distinct tenderness and marked spasm over the entire right lower quadrant, with some tenderness out along the right flank. Rectal examination was negative.

Examination of the blood showed a white-cell count of 17,500 with 88 per cent polymorphonu-

clears, the red-cell count was 4,900,000. Erythrocytes and platelets appeared normal. A blood Hinton was negative. No urinalysis or stool examination was reported.

Laparotomy was performed two hours after admission. The appendix was removed, and a culture taken of the peritoneum, which showed *Staphylococcus aureus*.

For the remainder of the day following the operation the condition of the patient was fairly good. The abdomen remained soft and non-tender. The pulse was of fairly good quality. That night, ten hours after operation, the clinical picture changed entirely. The patient became rather suddenly cyanotic, and the pulse more rapid, the blood pressure dropped to systolic 98, diastolic 70, there were moderate dyspnea and an elevation of temperature to 103.6°F. Cardiac stimulation was given and the patient improved somewhat, although his blood pressure did not rise above 100 systolic, 68 diastolic. The pulse rate was about 130 per minute. In the morning another attack of cyanosis and dyspnea occurred. He was given digifolin, intravenous glucose and caffeine, as well as oxygen, to no avail, and he died twenty hours after admission.

DIFFERENTIAL DIAGNOSIS

DR EDWARD L. YOUNG, JR. First, a few comments about the description of this pain. I have said for a great many years, and still believe, that in the vast majority of cases abdominal pain, whether epigastric, about the umbilicus or generalized, which shifts and localizes in the right lower quadrant, is due to appendicitis. That is, assuming the history can be relied on. I have seen two exceptions: the first, a gangrenous gall bladder presenting in the appendix incision, and the second, a gangrenous epiploic appendix of the cecum. So, assuming this story to be true, the patient is suffering from acute appendicitis. However, let us assume that it is another exception.

It is true that this onset is pretty vicious for acute appendicitis, particularly in a man of seventy-four, because at that age the symptoms are more likely to be atypical. The picture is usually one with vague abdominal symptoms, and when operation is finally done, one is apt to find an advanced stage of the disease. The bowels have moved several times so that the condition is presumably not one with intestinal obstruction, although, of course,

Beginning in October 1937 the clinical meetings at the Faulkner Hospital have been in the form of clinicopathological conferences with paper discussions of cases not previously seen by the discussor. This form of medical exercise originated by Dr. Richard C. Cabot at the Massachusetts General Hospital and at present directed by Dr. Tracy B. Mallory has met with enthusiastic response at the Faulkner Hospital. We are much indebted to Dr. Mallory for his kind advice and assistance in helping us to organize these conferences.

the bowels do move after obstruction, though generally not to this extent. The hernia is thought of, but strangulation should give more definite localization. The fact that the pain came on in spasms means that some hollow viscus is in trouble, and the persistent vomiting suggests either an interference with blood supply, such as a strangulated hernia, or trouble high in the gastrointestinal tract. They did consider trouble with the hernia and apparently had to throw out that diagnosis. The history lacks details about his "stomach trouble," but it certainly did not impress the examiner as being important, nevertheless, we must remember that perforation is often the first symptom of sufficient importance to call attention to an ulcer. It is equally true that a perforation of the duodenum can allow fluid to trickle down the right gutter so that the maximum tenderness is in the right lower quadrant. Is it possible that the history points toward a ruptured gall bladder with bile trickling down the right flank? I believe that is very remote. Gall bladders do rupture, but almost without exception into a walling-off mass of omentum. Gall-bladder disease generally has a degree of chronicity which produces protective adhesions so that free intraperitoneal rupture is uncommon.

What other things have we that are at all likely? Diverticulitis of the sigmoid, for instance, is very unlikely. Pneumonia with intra-abdominal symptoms is ruled out by the examination. After all, one has to take the weight of evidence and act on it. If every case that came to us for diagnosis was a typical story-book picture, there would not be any fun in the practice of medicine. Here it seems to me that the weight of evidence points toward an acute appendicitis. I am basing my diagnosis on the following: generalized abdominal pain shifting to the right lower quadrant, tenderness and spasm, slightly elevated temperature, and high white count with a high percentage of polymorphonuclears. We are told that the appendix was removed.

DR J. BEACH HAZARD: May I interrupt? The same diagnosis was made preoperatively as has been made by Dr. Young. At operation an appendix was removed that at the time looked innocent and later showed healed appendicitis with obliteration. A fibrinopurulent exudate was present about the cecum and extended along the ascending colon toward the subhepatic region.

DR YOUNG: Thank you. That does help because nine times out of ten, a healed appendix is essentially a normal appendix. There is a degree of fibrosis that increases in an appendix as we get older which is a normal process, but it can be pathologic and the pathologist cannot say whether the degree of sclerosis which he finds is actually

due to a pathologic process or merely to a physiologic one. However, in this case I believe the cause of the peritonitis was not acute appendicitis.

The peritonitis was said to be essentially right-sided. There is no evidence of a perforation of the cecum from a solitary ulcer, which, though rare, does occur. I think by a process of exclusion we must say that the patient had a small perforation of the duodenum with irritating fluid going down into the right lower quadrant. I should be interested to know how soon after eating this happened, because the farther away we get from a meal the more likely we are to find that the contents from a perforated stomach or duodenum are sterile. I have not spoken of a perforation secondary to a carcinoma, which we always think of at his age, because malignant disease that has gone far enough to perforate should have given other signs before this. I think the best bet is a peptic ulcer.

The final picture simply concerns which of the causes of death, common to such a picture as this, we have here. I believe that the causes of death following operation can be put into one of five classes: pulmonary embolus, cerebral accident, coronary disease, shock or hemorrhage. Shock may be due to various things—not only surgical shock but overwhelming infection, particularly in the peritoneal cavity. This patient did have *Staphylococcus aureus* in the peritoneal cavity, and I believe the cause of death was peritonitis. Of course, I cannot rule out pulmonary embolus, but death occurred quite soon after operation, nevertheless, it may be the answer. At seventy-four, I suppose that I should think more seriously of a cerebral accident or an acute cardiac accident, but I am betting against them.

DR FRANCIS G. BARNUM: Is there any possibility of acute pancreatitis?

DR YOUNG: Perhaps I should have mentioned it, but I have never seen this disease with a shifting of the symptoms and signs to the right lower quadrant.

A PHYSICIAN: May you not have peritonitis without any obvious cause?

DR YOUNG: That is perfectly true. The only idiopathic types I know of are streptococcus or pneumococcus peritonitis, metastatic from a point outside the peritoneum.

DR HORACE K. SOWLES: I have been able to find on record no cases of so-called idiopathic peritonitis over the age of thirty-two years.

DR CHANNING FROTHINGHAM: Since the patient is so old, why do you not think of some disturbance in the circulation of the mesentery?

DR YOUNG: The pain that is associated with mesenteric thrombosis is more or less a steady pain. I have never seen pain of this type with that sort

of thing. Moreover, in fifteen hours a positive culture should not be obtained from the peritoneal cavity.

DR FROTHINGHAM Too soon?

DR YOUNG Yes

DR BASIL E. BARTON Do you not believe that, where there are cyanosis and dyspnea, pulmonary embolus is indicated rather than peritonitis?

DR YOUNG Not necessarily. I checked up on pulmonary embolus and found that there were as many cases that died of pulmonary embolus without cyanosis as with it and that cyanosis was present where the cause of death was something else so often that I am not using it as being indicative of pulmonary embolus. I believe that this man died of shock from an overwhelming infection of the peritoneum coming from a perforated peptic ulcer.

CLINICAL DIAGNOSES

Perforation of the gall bladder
Acute peritonitis
Peripheral circulatory collapse

DR YOUNG'S DIAGNOSES

Perforated peptic ulcer
Acute peritonitis

ANATOMIC DIAGNOSES

Chronic duodenal ulcer with perforation
Peritonitis, acute, right side of peritoneal cavity
Myocardial fibrosis, left apex
Bronchopneumonia, early
Arteriosclerosis

PATHOLOGICAL DISCUSSION

DR HAZARD Only the right side of the peritoneal cavity evidenced a deposit of fibrin and a purulent exudate. This was most abundant about the gall bladder and duodenum. The appendix stump was intact. The ampulla of the gall bladder was firmly adherent to the superior surface of the duodenum. On opening the latter an ulcer, 2.5 cm in greatest diameter, was found situated about 1.5 cm from the pylorus and immediately adjacent to the region of adherence to the gall bladder. A gross perforation was not evident at first but after fixation and sectioning, a small communication 1 or 2 mm in diameter was found to extend from the lateral portion of the ulcer base through the visceral peritoneum. The gall bladder was negative except for a pericholecystitis. The other finding of interest was an old scar 1.5 cm in diameter, in the apex of the left ventricle. The coronary arteries were patent but presented marked arteriosclerotic changes. A culture of blood from the right ventricle was negative, and one from the exudate in the peritoneal cavity showed *Staphylococcus aureus*.

The extent of the peritonitis did not seem sufficient for this alone to be the cause of death, but with the exception of the scarred myocardium no other important gross anatomic lesion was evident. Histologically an early bronchopneumonia was found but was so slight that it probably did not contribute materially to the patient's exitus. Because of restrictions, the head was not examined. It was felt that the immediate cause of death could be ascribed to circulatory collapse.

CASE 6375

PRESENTATION OF CASE

A Canadian motorman, aged fifty-four years, was admitted because of precordial pain.

The patient had been in fair health until one year before admission at which time he noted a rather insidious onset of precordial pain coming on after exertion, and occasionally after meals. This pain was described as being of a dull oppressive type, rather transitory, and exhibiting no radiation. Coincident with the development of this pain he observed a moderate amount of dyspnea on exertion, and more recently had had a tendency to orthopnea. The pain and dyspnea occasioned the patient no great amount of discomfort, and he worked steadily until three weeks previous to admission at which time the precordial pain became more severe and was accompanied by the onset of rather marked weakness, mild diarrhea and an increase in dyspnea and orthopnea. A cough, which the patient had had for some years became much more marked but was productive of only the whitish mucoid material ordinarily noticed. Two weeks before entry the patient experienced one day of severe and agonizing precordial pain, which radiated down the left arm and through to the left scapula. He had been taking digitalis during the three weeks before entry and had remained in bed for the greater portion of this time. Extensive x-ray studies of the chest, gastrointestinal tract and gall bladder at the office of a roentgenologist had been made a few days before admission. No edema or other signs of congestive failure had been noted. The patient was said to have had a temperature of 102 or 103°F about a week before he came to the hospital.

He was born in Nova Scotia but had lived around Boston for more than thirty-five years. His general health had been good. He had had the usual childhood diseases without apparent complications or sequelae. There was no history of rheumatic fever, scarlet fever, diphtheria, typhoid fever or syphilis. He had had an appendectomy performed seven years previous to admission. For many years he had had 'bronchit

trouble," which was characterized by a chronic cough productive of whitish mucoid phlegm. His past history was otherwise essentially negative prior to the present illness. He had lost from 10 to 15 lb. in the year previous to admission.

There was no history of familial disease. The patient's father died of "senility" at eighty-eight years and his mother of "apoplexy." He had been married for seventeen years, and his wife was living and well. There were no children.

Physical examination showed a well-developed and nourished man lying comfortably in bed, he was somewhat orthopneic and had a tired, worn-out appearance. One observer thought there was an icteric tint to the sclerae. He was slightly confused and unable to concentrate well in conversation. Thought sequences were distorted. There was no tremor of the extended fingers. The pupils were slightly irregular and showed a moderate arcus senilis. They reacted to light and accommodation. The fundi revealed moderate arteriosclerotic changes, the disks showed definite cupping. Sinuses, nostrils, mouth and teeth were not remarkable. There was no generalized enlargement of the lymph nodes. The supracardiac diameter was 7 cm. The heart was enlarged to the left as far as the anterior axillary line, and there was questionable enlargement to the right. The heart action was slow, but the rhythm was grossly irregular. The heart sounds were very distant and of poor quality. No murmurs could be heard. The peripheral vessels, especially the radial arteries, were arteriosclerotic. The pulses were equal but of poor quality. The blood pressure was 110 systolic, 46 diastolic, and a later reading was 110 systolic, and 70 diastolic. The percussion note over the lung fields was resonant except for a small area at the angle of the left scapula where there was bronchial breathing with increased whispered and spoken voice. A second observer did not confirm this. Elsewhere the breath and voice sounds were normal. A few moist rales could be heard at both lung bases. The abdomen was fully relaxed and revealed no masses, spasm or tenderness. There was an incisional hernia at the lateral border of the right rectus muscle in the lower quadrant. The liver and spleen were not palpable. Knee jerks were diminished but were about equal. The Babinski sign was equivocal, Gordon and Oppenheim signs were negative. There was no patellar or ankle clonus. Vibration sense was normal. Rectal examination was negative. The prostate was mildly and symmetrically enlarged but was of average consistence.

On admission the temperature was 98.6°F., the pulse 52 and the respirations 32. The urine showed a slightest possible trace of albumin and occasional

erythrocytes but no white blood cells or casts, a second urinalysis was negative. The specific gravities were 1.017 and 1.022. The white blood-cell count was 15,800, with 83 per cent polymorphonuclears, 11 per cent lymphocytes and 6 per cent young polymorphonuclears. The red-blood-cell count was 5,100,000, with 99 per cent hemoglobin (Sahli). Red blood cells and platelets appeared normal. Stool examination was negative. A blood Hinton test was negative. The blood nonprotein nitrogen was 41 mg. per cent.

A six-foot chest plate showed the transverse diameter of the heart to be 17.5 cm. Internal diameter of chest was 28.8 cm. The great vessels measured 6.0 cm. The heart was enlarged to the right and left, and there were pulsations of normal intensity and rhythm. The esophagus was displaced slightly to the right and posteriorly. There was a small amount of fluid in the right chest, which partially obscured the costophrenic angle. The x-ray impression was cardiac enlargement with no evidence of hydropericardium.

An electrocardiogram taken on the day of admission showed auricular fibrillation, ventricular complexes that were not remarkable, two ventricular extrasystoles and no evidence of overdigitalization.

The patient's course in the hospital was uneventful although he seemed to improve. After two days his temperature rose to 100°F. every afternoon. The pulse varied between 60 and 80 but rose to 100 on the fifth day, respirations were between 20 and 25. Five days after admission, while sleeping, he suddenly became cyanotic, gasped several times and died.

DIFFERENTIAL DIAGNOSIS

DR WILLIAM R. OHLER. We are first interested in an analysis of the patient's history. This is a very interesting case, and I think that I can begin with a little different approach.

First, there is one possibly important point in the family history. It states that the mother died of "apoplexy," but no mention is made of the mother's age at the time of death. It is possible that this man may have started out with a hereditary factor insofar as hypertension is concerned.

Let us next consider one or two facts about the patient's past history. There was no history of rheumatic fever but there was a history of bronchial trouble for a good many years. This may be of importance when we come to take up some of the points in the present illness.

Coming to the present illness, we have a fifty-four-year-old white man who had been in reasonably good health and able to carry on his work until a short time before his admission to the hospital. However, about a year before

his admission he began to note the onset of precordial pain which bore a very definite relation to exertion. We note that the precordial pain was supplemented a little later by dyspnea, which as time went on became severe enough to cause orthopnea. Thus we have a pretty good picture of coronary disease, probably sclerotic in nature, with evidence of beginning myocardial failure.

About two weeks prior to admission the patient had a rather severe attack of precordial pain, very sharp in nature, which radiated into the neck, the region of the left scapula and down the left arm. This certainly sounds like an attack of coronary occlusion. The cough which had been present for some years then became a little bit more marked. Also, the record states that the patient had a temperature of 102 or 103°F for some time prior to entrance to the hospital. This would be consistent with acute coronary disease or a mild pulmonary infection superimposed on the chronic bronchitis, or both.

The statement that the patient was somewhat confused and unable to concentrate well in conversation and reading, I am unable to explain other than to say that patients with congestive heart failure are very frequently mildly psychotic. The fundi revealed moderate arteriosclerosis. Then there is a note here that the disks showed definite cupping. I am not sure that that indicates anything more than physiologic cupping. There is no evidence of disturbance in vision, no headaches or no mention of anything suggesting glaucoma.

Turning for a moment to the examination of the heart, we find that it was enlarged, the rhythm was grossly irregular, suggesting auricular fibrillation. There is no mention of auricular fibrillation in this patient's history prior to admission to the hospital. If he had no auricular fibrillation prior to the onset of his acute attack of cardiac pain, then it is reasonable to suppose that the auricular fibrillation came after that. On the other hand, if he had auricular fibrillation prior to the onset of the attack, that makes one wonder as to whether he had coronary disease, because people with auricular fibrillation, by and large, do not get coronary attacks anywhere near so frequently as people without it. They may develop auricular fibrillation following attacks. I am assuming that this individual developed auricular fibrillation following his attack of cardiac pain.

He had a very low blood pressure and a relatively high pulse pressure. This is consistent with coronary disease. We know nothing about this patient's blood pressure prior to his present illness, but on the basis of his family history it is fair to assume that he had hypertension before the onset of cardiac symptoms.

There is no evidence of edema and no evidence of an enlarged liver, this suggests that, despite the story of right-sided enlargement, there was no right-sided failure. Such evidence of failure as we have points to the left side, which is consistent with hypertensive heart disease. This man ran a temperature while he was in the hospital, and if he had had an acute coronary occlusion two weeks before admission, this is a little bit long for the temperature to persist. Nevertheless, I have no other explanation unless he had a lesion in the chest of infectious origin. Subsequent laboratory work which was done in the hospital, including x-rays and electrocardiograms, only lend support to the picture which we are attempting to develop. He had an enlarged heart. He had some moist rales suggesting a little fluid at the lung bases. He had an electrocardiogram which showed auricular fibrillation.

This individual did pretty well and then died very suddenly five days after admission. He died during the night, and his death was associated with cyanosis. No mention is made in the record concerning the rapidity of death. It is assumed that death was extremely sudden and that no time element could be stated. That is perhaps important in trying to figure just what caused death. Cardiac deaths can be very sudden, deaths from embolus are likely to be not so sudden. Generally, the shortest period of death from embolus is not less than ten minutes.

In summarizing the situation, we have an individual who gives a pretty good story of coronary sclerosis, with increasing evidence of myocardial weakness—a story that suggests an attack of coronary occlusion roughly about three weeks before death, a progressively downward course since then, insofar as evidence of cardiac pain was concerned, a persistence in temperature, and then sudden exitus. If one assumes that he had coronary occlusion, then one can assume that his death was due either to mural thrombosis or to rupture of the ventricular wall at the site of a very large infarct. I am inclined to feel that this individual had hypertensive heart disease with an enlarged heart, coronary sclerosis and coronary occlusion complicated by a large infarct in the heart wall, which ruptured at the time of death. The fact that cyanosis was noted does not help us one way or the other because you can have cyanosis associated either with a rupture of the ventricular wall or with a large pulmonary embolus.

If this individual had auricular fibrillation prior to the onset of this rather sharp pain, one is entitled to say something in favor of another possible diagnosis. If you read over the record you will note that, in addition to the x-ray showing

that the heart was enlarged, there is some suggestion by x-ray that the esophagus was deviated somewhat to the right. Apparently no pulsation was felt. It is perfectly possible that an individual with a dissecting aneurysm might give a story somewhat similar to this. There was precordial pain to begin with, terminating in an acute episode at the end. I do not believe that I can rule out the possibility of a ruptured dissecting aneurysm as the cause of death. Nevertheless, on the weight of evidence, I am in favor of my former diagnosis.

DR JAMES A. HALSTED: I saw the patient in the ward and felt that he probably had coronary thrombosis, but because of the high white count, the elevated temperature and some dulness in one side of his chest, I thought that he might have a pulmonary infarct.

CLINICAL DIAGNOSES

Arteriosclerosis, general
Infarction of myocardium, due to arteriosclerotic coronary thrombosis
Rupture of heart due to infarction

DR. OHLER'S DIAGNOSES

Hypertensive heart disease
Coronary arteriosclerosis
Coronary occlusion with ruptured ventricular infarct

ANATOMIC DIAGNOSES

Cardiac infarction, old, due to arteriosclerosis and thrombosis of the anterior descending branch of the left coronary artery
Rupture of old myocardial infarct
Hemopericardium
Mural thrombi, left ventricle
Hydrothorax, partial, bilateral
Chronic bronchitis

PATHOLOGICAL DISCUSSION

DR J. BEACH HAZARD: On opening the pericardium a layer of adherent fibrin was encountered which when disrupted revealed a pericardial cavity filled with blood. A thin layer of shaggy, blood-stained material covered much of the pericardial surface. The heart was enlarged, and the apex of the left ventricle bulged outward. At the lateral, inferior margin of this bulging portion was an irregular tear, 1.8 cm. in length, which communi-

cated with the left ventricle. The wall in this vicinity was thinned to 1 or 2 mm. in thickness, and the tissue on either side was white and tough. This white tissue, with occasional rare muscle bundles, formed most of the wall of the apex. The lining surface presented firmly adherent mural thrombi. The anterior descending branch of the left coronary artery at a point 1.2 cm. from its origin was occluded by white and brownish-white tissue, and its wall was partly calcified. Histologically, sections through the apex revealed dense connective tissue and occasional bundles of muscle, but no region of acute infarction. A zone of polymorphonuclear infiltration was present near the outer aspect of the line of rupture. The fibrin on the epicardial surface was partly organized. The infarct was old, and it does not seem possible it could have been the cause of the attack two weeks before death. This might have been associated with a beginning leak into the pericardial sac, as the layer of fibrin on the pericardium could be estimated at somewhat near that age.

The heart was markedly enlarged, chiefly due to dilatation of the left ventricle.

DR. OHLER: By an old infarct you mean it happened when?

DR. HAZARD: I do not believe it could possibly have happened under a month. The story of the attack of pain and of fever is just about two weeks before death. The infarct is much older than that. As a bare second possibility, the temperature might be accounted for by a respiratory infection as there was a marked chronic bronchitis.

DR. HALSTED: The history was inaccurate, as I remember it. Is it possible that the pain might have occurred a month before instead of two weeks before death?

DR. RAYMOND CLAPP: No, this acute episode had occurred about two weeks previously as attested to by his wife.

DR. CHANNING FROTHINGHAM: This case emphasizes the importance of making the diagnosis of coronary occlusion promptly because other diagnostic procedures such as were carried out on this patient necessitate appreciable exertion, which is of course contraindicated in the early days of coronary occlusion. Furthermore, if coronary occlusion is suspected it would be well to postpone for a time diagnostic procedures for the diagnosis of conditions which do not need immediate treatment.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24041

PRESENTATION OF CASE

A fifty-six-year-old, white, single, Canadian-born female entered the hospital with a diagnosis of ischio-rectal abscess of three weeks' duration.

Seven weeks before entry she had a gastrointestinal upset, with fairly marked diarrhea and the passage of small amounts of bright-red blood by rectum. During the succeeding weeks she continued to have intermittent attacks of diarrhea, but they slowly lessened in severity until at the time of entry they gave her relatively little trouble. Three weeks before entry she noticed superficial tenderness on the left side of her rectum. This tenderness gradually increased and became much more severe in the last week before entry. In spite of poulticing, the pain finally became unbearable. She consulted her physician, who lanced an abscess near the rectum and sent her to this hospital.

The past and family histories were essentially negative.

Physical examination revealed a fairly well-developed and nourished woman lying in bed. The chest and abdomen were negative. The blood pressure was 130 systolic, 70 diastolic. Just to the left of the rectum was a large, bulging, fluctuant ischio-rectal abscess.

The temperature was 98°F, the pulse 85. The respirations were 20.

Examination of the urine was negative.

On the day of entry the ischio-rectal abscess was incised and drained, and an anal fistula repaired. The following day the temperature rose to 103°F, and she appeared very ill. During the next two days her condition improved somewhat, but on the fifth day she began to complain of generalized soreness and developed increasing distention with some vomiting. Examination revealed moderate tenderness of the abdomen, more marked in the left epigastric region, with hyperactive peristalsis. No masses could be made out. During the next three days these symptoms became more pronounced, and an x-ray on the ninth hospital day showed marked gaseous distention of the stomach and dilatation of the jejunum. There was no

visible gas in the colon. At that time the blood showed a red-cell count of 3,930,000 with 70 per cent hemoglobin. The white-cell count was 10,600, 77 per cent polymorphonuclears. The nonprotein nitrogen of the blood serum was 50 mg per cent, the protein 5.6 gm per cent, and the chlorides equivalent to 101 cc of N/10 sodium chloride. An exploratory laparotomy was done, and a large localized abscess was found between the ileum and cecum. On aspirating the pus a large perforation was discovered in the cecum, through which fecal matter oozed into the abscess cavity. A large soft rubber tube was sutured into the perforation and two cigarette drains placed down in the abscess cavity. A Witzel ileostomy was done. On the following day the temperature was 102°F, and the blood showed a white-cell count of 17,800. She was quite lethargic and almost in a moribund condition. Wangensteen suction was instituted, and during the next three days she seemed to improve. On the eleventh day, three days after the laparotomy, her temperature was almost normal, the white-cell count 10,700, with 95 per cent polymorphonuclears, the nonprotein nitrogen 44 mg per cent, the protein 4.8 gm per cent, and the chlorides equivalent to 107 cc N/10 sodium chloride. Two days later she was found dead in bed. An hour before death she had seemed to be in fairly good condition.

DIFFERENTIAL DIAGNOSIS

DR. LELAND S. MCKITTRICK. So far as I am concerned all the laboratory work can be put aside as of no help in arriving at a diagnosis. We have then a fifty-six-year-old woman who apparently was well until seven weeks before she came in, when she had an attack of bloody diarrhea which persisted for at least three weeks and apparently had not entirely subsided, because the statement is that it gave her relatively little trouble at the time of entry. Then she developed an ischio-rectal abscess and came into the hospital. The ischio-rectal abscess was drained, and instead of being better she became a very sick patient, with a temperature of 103°F. It seems to me that that probably means the flaring up of a pre-existing process.

She goes on with abdominal distention and x-ray evidence of a dilated stomach and jejunum. Then she was operated upon again, an abscess was found between the terminal ileum and the cecum, and a fistulous opening was demonstrated in the cecum.

Perhaps this would be a good time for Dr. Holmes to show the x-rays, so we can have all the cards on the table before we proceed.

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES. I can only point out what is already mentioned in the report. The

dilated stomach is evident, and here are the loops of dilated small bowel. We can be reasonably certain that they are small bowel. There seems to be an unusual amount of density in the lower part of the pelvis, which may be apparent only because the films are portable and underexposed. There may be some fluid present. I do not see anything that will give us any real help. In the text it says that there is no visible gas in the large bowel. I think that might be questioned, although it is more likely to be correct.

DIFFERENTIAL DIAGNOSIS (CONTINUED)

DR. McKITTRICK: Why do we not put the x-rays with the other laboratory work and say that they are of no help?

DR. HOLMES: The x-rays do show definite evidence of obstruction.

DR. McKITTRICK: Yes, but I do not think that that is the cause of her trouble. I think we have a right to assume that she has a process involving the entire colon and that she has ulcerations in the colon, one of which has gone through the rectum and formed an ischio-rectal abscess, the other through the cecum resulting in the abscess found at operation.

If, then, we assume the presence of ulcerations in the cecum and rectum, I believe we may feel fairly confident that the intervening bowel is involved in a similar though less marked process. If this is so, then we have to make a diagnosis of some form of ulcerative colitis. The two types of the disease that one needs to consider are so-called chronic idiopathic ulcerative colitis and amebic dysentery. We have no evidence pointing to amebic dysentery, and we have nothing to prove that she did not have idiopathic ulcerative colitis. When the abscess between the terminal ileum and cecum was first mentioned, of course the first thing that came to mind besides appendicitis was a regional ileitis of some type, but I do not believe we have any reason for more than mentioning such a process.

I feel quite stupid about the whole thing, but either the diagnosis is easy or I am entirely wrong. I believe she had idiopathic ulcerative colitis with perforation of the cecum and erosion through the rectum. If that is the diagnosis, why did she die? I think she was probably sicker than the final note would lead one to suspect. The note says "An hour before death she had seemed to be in fairly good condition." The most common cause of finding a patient of her age dead in bed after operation is pulmonary embolism, and I suspect that she may have had it, it is quite possible, however, that she did not. She had a localized peritonitis, and that may have become generalized. I shall

only say that she died of ulcerative colitis with perforation.

CLINICAL DISCUSSION

DR. RICHARD H. SWEET: There are one or two clinical aspects of this case that are not in the record but are of interest. I think Dr. McKittrick is to be complimented on making the correct diagnosis. I did not think it was so easy when I first saw her with the ischio-rectal abscess. She did not have constant diarrhea, but she had had two months of intermittent attacks. On opening the ischio-rectal abscess there was a sizable ulcer in the rectum, not an ordinary fistulous opening. It is so unusual to find the internal opening that I was surprised to find an ulcer there. She was abnormally sick after draining the abscess. About three or four days later she commenced to have massive hemorrhages, which are not mentioned in the record. She bled profusely from the rectum and for a period of about a week had intense lower abdominal pain, in the meantime becoming gradually very distended, I was puzzled because I did not think she had obstruction of the large intestine. I thought the abdominal film demonstrated quite conclusively that she had small-bowel obstruction and dilatation. Dr. Allen saw her with me that night, and I operated on her with a pre-operative diagnosis of obstruction of the small intestine, the cause of which was unknown. She was a little tender in the right lower quadrant. I made my incision where one would ordinarily for an ileostomy and came down right over an abscess. The thing that made the diagnosis difficult for me was that the colon was not dilated in spite of the fact that it was perforated. I thought she must have ulcerative colitis, since perforation had occurred. There was a definite abscess, and several loops of small intestine were adherent to it. There were dilated loops above this point and collapsed loops below. We drained the abscess and put a tube in the cecum and one in the ileum. The surprising thing was that she lived for three days after that, but she was in very poor condition before she died.

CLINICAL DIAGNOSES

Ischio-rectal abscess
Perforated cecum
Peritonitis

DR. McKITTRICK'S DIAGNOSIS

Idiopathic ulcerative colitis with local and possibly general peritonitis

ANATOMIC DIAGNOSES

Ulcerative colitis with perforation of the cecum
Peritonitis, acute, localized

Cecostomy
 Ileostomy
 Ischiorectal abscess with drainage incision
 Fatty vacuolization of the liver
 Infarcts of the right kidney, healed and recent
 Pulmonary edema and hyperemia
 Hydrothorax, bilateral
 Ascites
 Arteriosclerosis of the coronary arteries and the aorta
 Operative scar supracervical hysterectomy and bilateral salpingo-oophorectomy

PATHOLOGICAL DISCUSSION

DR. BENJAMIN CASTLEMAN The autopsy showed just about what Dr McKittrick predicted. There was not, however, a general infection of the peritoneal cavity. The peritonitis was localized to the cecal region. On opening the cecum we found a number of acute ulcerations, one of which had perforated. There were ulcerations throughout the whole large bowel, but very few in the sigmoid and descending colon and just an occasional small one farther down. We were unable to find any perforation of the rectum. This case is unusual because in this disease the most severe lesions as a rule are in the sigmoid and rectum and gradually become smaller or not apparent in the cecum. Here, it was just the reverse. We were unable to account for her death. There was no embolus and no coronary thrombosis. We did not examine her head, but I doubt whether we would have been able to find anything there.

DR. SWEET She was never well enough for us to do a proctoscopic examination.

DR. CASTLEMAN How often do you see an ischiorectal abscess as the first indication of ulcerative colitis?

DR. MCKITTRICK We get off on the wrong foot in these cases because when we see someone with an abscess, that stops the investigation. They are common, and we do not think too much about them. Anyone who has bloody diarrhea for three or four weeks has something the matter with him. I have been on service enough to know that when someone with a common disease like ischiorectal abscess is presented to you, the past history of bloody diarrhea is apt to be minimized and put in the background with the result that nothing is said about it and not much attention is given to it. I think it is fair to say that some type of ulceration through the rectum into the vagina or into the ischiorectal area is not uncommon in the course of the more acute cases of ulcerative colitis.

The hemorrhage which Dr Sweet speaks about interests me because one gets such massive hem-

orrhages in patients who have large deeply penetrating ulcers overlying the mesenteric border. In what little experience I have had with this most extraordinary disease, the cases with massive hemorrhage are very apt to be fatal.

CASE 24042

PRESENTATION OF CASE

First Admission A sixty-three-year-old Irish club steward entered the hospital with the complaint of hematuria of four years' duration.

Four years before entry he began having hematuria, which occurred about once every three months and lasted about a day. Two and a half years before entry cystoscopy revealed a large sessile growth and four small papillomatous growths at the base of the bladder, all of which were deeply cauterized by diathermy. At intervals up to the time of entry diathermy cauterization was repeated for recurrent growths. During the three months before entry he was essentially symptom-free except for increase in his nocturia to three times a night and occasional sharp, fleeting pain on urination. During the week before entry this pain increased in severity. He never had any retention, incontinence or difficulty in starting the stream.

His past and family histories were essentially negative. He had had no significant weight loss in the five years before entry.

Physical examination revealed a rather emaciated man in no apparent discomfort. The teeth were carious. There was an empyema scar on the lower right chest posteriorly but the lungs were essentially negative except for slight dullness at the right base. The blood pressure was 160 systolic, 90 diastolic. Rectal examination was negative.

The temperature was 98.6°F, the pulse 62. The respirations were 20.

The urine had a specific gravity of 1.020 and contained the slightest possible trace of albumin. A phenolsulfonephthalein test of renal function gave 40 per cent excretion in an hour and a total of 50 per cent in two hours. The nonprotein nitrogen of the blood serum was 35 mg per cent.

Cystoscopy revealed a papillary growth on the left side of the bladder involving the orifice and extending from 12 o'clock to about 5 o'clock. On the fourth hospital day a suprapubic cystotomy was done and the growth thoroughly treated with diathermy. He was discharged on the sixteenth hospital day.

Second Admission (two years later) Repeated cystoscopic examinations during the next year were negative, and up to three weeks before re-entry he was entirely symptom-free, with nocturia only once a night. At this time he again had hematuria which occurred twice a week until entry.

Physical examination was essentially negative except for slight enlargement of the prostate

The temperature was 98.6°F., the pulse 80 The respirations were 20

The urine showed a specific gravity of 1.024 and contained a slight trace of albumin with rare white blood cells in the sediment A phenolsulfonephthalein test of renal function showed 70 per cent excretion in two hours The nonprotein nitrogen of the blood serum was 32 mg per cent, and a blood Hinton was negative

X-rays of the abdomen were essentially negative

Cystoscopy revealed a small, white, solid looking tumor about the size of a pea on the posterior upper right wall of the bladder, which was cauterized Bilateral vasectomy was also done He was discharged on the nineteenth day

Third Admission (seven years later) He was seen at intervals in the Out Patient Department without evidence of recurrence until a month before entry, when he again had hematuria His general health had been good except for slight dyspnea on exertion

Physical examination showed marked peripheral arteriosclerosis, with a loud apical systolic heart murmur and a blood pressure of 200 systolic, 100 diastolic

The temperature was 98°F., the pulse 55 The respirations were 20

The urine showed a large trace of albumin and contained many red blood cells The blood showed a red-cell count of 4,960,000 with a hemoglobin of 80 per cent, and a white-cell count of 11,500 The nonprotein nitrogen of the blood was 39 mg per cent

Cystoscopy revealed a good-sized, translucent, papillary growth just inside the bladder outlet on the left at 5 o'clock The growth was thoroughly coagulated, and a few strips of tissue were removed from the median bar of the prostate, which on pathological examination showed fibrosis and chronic inflammation He was discharged on the tenth day

Final Admission (eight months later) Four months after discharge, while exerting himself strenuously, he suddenly coughed up two mouthfuls of bright-red blood This incident was unaccompanied by other symptoms Cystoscopy was done shortly afterward and showed no evidence of recurrence About a month later, three months before re-entry, he began to notice slight swelling of his ankles, which disappeared at night Two months before entry he discovered that he had gained a few pounds in weight and that the swelling of his ankles was more pronounced and failed to regress at night He also noticed that his abdomen was becoming more protuberant, and he

began to lose his appetite Two weeks before entry he entered an outside hospital, where a barium enema was reported to be negative By that time the swelling of his legs had reached to his knees, and the distention of his abdomen was very uncomfortable The drinking of fluids caused considerable abdominal discomfort, and his bowels, which had always been regular, became constipated so that he had to take laxatives He had no cardiorespiratory symptoms, vomiting or abdominal pain He had never had hematemesis, melena or jaundice, and he drank no alcoholic beverages

Physical examination revealed an emaciated man in some discomfort The retinæ showed moderate arteriovenous nicking The heart was slightly enlarged to the left, and there was a soft, blowing systolic murmur at the apex There was an intermittent arrhythmia, and the sounds were somewhat distant The blood pressure was 184 systolic, 98 diastolic The lungs showed slight dullness at the left base with diminished breath and voice sounds The abdomen was moderately distended, and shifting dullness and a fluid wave could be detected The liver dullness was thought to extend 2 cm below the costal margin The legs showed pitting edema up to but not including the knees The rectal examination was negative except for moderate symmetrical enlargement of the prostate

The temperature was 98.6°F., the pulse 75 The respirations were 20

The urine examination was negative except for 8 to 10 white cells per high-power field and rare red cells in the sediment The blood showed a red cell count of 3,440,000 with a hemoglobin of 65 per cent The white-cell count was 5300, 58 per cent polymorphonuclears A guaiac test on the stool was negative The nonprotein nitrogen of the blood was 40 mg per cent, and the vital capacity of the lungs was 2500 cc. An x-ray of the chest showed prominence of the heart in the region of the left ventricle and a very tortuous, dilated aorta with marked calcification of the aortic knob The right diaphragm was slightly high, respiratory motions were normal, and there was no evidence of pulmonary metastases An x-ray of the pelvis showed marked arteriosclerosis of the pelvic and femoral vessels with no evidence of metastases

Catheterization produced only 60 cc of residual urine, and cystoscopy revealed no evidence of recurrence of tumor of the bladder Before cystoscopy he was given ¼ gr morphine sulfate and 1/150 gr scopolamine subcutaneously When he returned to the ward he was extremely stuporous, with a respiratory rate of 6 He was given caffeine subcutaneously and coramine intravenously with-

out visible improvement. Finally he was given a large dose of caffeine sodiobenzoate intravenously, which produced rapid and dramatic recovery. The following day his respiratory rate was 12. On that day he vomited coffee-grounds material which gave a 2+ guaiac test.

On the seventh hospital day an abdominal paracentesis yielded 3000 cc of clear, light yellow fluid. The fluid had a specific gravity of 1.009, contained 1.1 gm per cent protein and 9000 red cells and 200 white cells per cu mm. No tumor cells were found. On that day the guaiac test on the stool was 3+. On the following day an electrocardiogram showed slight left axis deviation, low T₁, T₂ and T₄, flat T₃ and slurred R₁, R₂ and R₃. A Takata-Ara test was positive. In spite of digitalization and injections of salyrgan, he continued to accumulate fluid, and on the tenth day 3000 cc was again removed from the abdomen. At that time it was noticed that his skin was slightly icteric, and the van den Bergh was 4.05 mg per cent, direct. The nonprotein nitrogen of the blood was 47 mg per cent. The icterus gradually became more pronounced, he became progressively weaker and gradually went into a semistuporous condition. On the seventeenth day he had intermittent spasms of abdominal pain and shortly afterward vomited about 90 cc of bright-red blood. A few hours later he passed some blood by rectum. The following day he died. At no time was the jaundice very marked.

DIFFERENTIAL DIAGNOSIS

DR. JOHN H. TALBOTT: This is the story of a sixty-three-year-old Irish club steward who was seen in the clinic and admitted to the hospital on several occasions for hematuria, presumably caused by a bladder tumor. Most bladder tumors are benign, but they must be watched with great care lest they become malignant. The description of one of the tumors, as given in the history at the first admission, suggests cancer. Since most tumors which become carcinomatous show evidence of this by becoming invasive at the base, it is worth noting that at a previous cystoscopy a large sessile growth was seen.

The history states that four months before his final admission the patient coughed up two mouthfuls of bright-red blood. If this statement were true, the most likely explanation of such a hemoptysis, in the absence of any severe cardiac symptoms, would be pulmonary tuberculosis or a pulmonary tumor. In view of the rest of the story, however, I do not believe that the patient coughed up the blood, but rather that he vomited it and that it came from the stomach or the esophagus. The statement that the patient never drank any al-

cohol must be accepted with reservations, he was a club steward and at least had the opportunity to take alcohol if he desired it.

The patient had dyspnea on exertion, which suggests a poorly functioning heart and vascular system, and on physical examination there was an elevation of the blood pressure with marked peripheral arteriosclerosis. With this evidence I think we can make a diagnosis of generalized arteriosclerosis and say that he probably had some sclerosis of the vessels of his heart. I cannot go farther than this, and I do not believe that the peripheral edema was of cardiac origin. The important thing to decide is whether this man had carcinoma or whether he had cirrhosis of the liver. He had edema of the legs which extended up to the knees, as well as an accumulation of fluid in his abdominal cavity. The specific gravity of the fluid was 1.009 with 1.1 gm per cent protein and about 9000 red cells per cu mm. This is consistent with a transudate and quite characteristic of that obtained in patients with cirrhosis of the liver. The fact that there were some red cells should not bias us in favor of an exudate from carcinomatosis.

In addition to cirrhosis of the liver and cardiac decompensation the other most common cause of peripheral edema is renal insufficiency. I do not believe, however, that this patient had any fulminating renal lesion. He probably had nothing more than some sclerosis of the renal vessels which accompanied the generalized arteriosclerosis. The specific gravity of the urine was high, and the nonprotein nitrogen of the blood was only slightly elevated above normal.

I think that the accumulation of fluid came from liver insufficiency, and our next decision is whether it was a primary cirrhosis of the liver or a secondary involvement from a metastatic carcinoma. This patient had been treated over a period of twelve years for a recurring tumor, but cystoscopy at the last admission showed no evidence of recurrence. Therefore I do not see how we can make a diagnosis of benign tumor of the bladder, eventually becoming malignant and metastasizing. At some time or other we would have had obvious evidence of cancer if this tumor had been anything but a benign growth. If this liver insufficiency was not caused by metastasis from a carcinoma elsewhere, the other likely possibility is a primary cirrhosis. The history states that this patient did not consume alcoholic beverages, and if he did not have an alcoholic cirrhosis, it is possible that he was suffering from an idiopathic cirrhosis. There is no evidence from the history of long-standing biliary-tract disease, and I think we can dismiss the question of a biliary cirrhosis. Rare forms, such as syphilis of the liver,

hemochromatosis and thrombosis of the portal vein, can likewise be dismissed

The question of cancer seems to be the specter in this case, and I believe we should bring up the question of a primary liver cancer superimposed on a cirrhosis. The clinical picture is certainly consistent with the diagnosis of cancer. The slight jaundice, which was never marked, is in favor of a primary cirrhosis of the liver. If he had metastatic involvement of the liver sufficient to give ascites his jaundice should have been much deeper.

I think that the cause of death was cholemia and hemorrhage. The rectal bleeding is a little disturbing, I confess, and I have not satisfactorily explained it. The hematemesis which was observed terminally could be accounted for by bleeding from varices of the esophagus. The fact that the spleen was not felt is against the diagnosis of cirrhosis, but a slight enlargement of the spleen might have been overlooked.

In conclusion, I believe this patient was suffering from generalized arteriosclerosis, idiopathic cirrhosis of the liver and possibly a cancer which was primary neither in the bladder nor in the prostate, but possibly in the liver.

DR. TRACY B. MALLORY: There was one point in the record which Dr. Talbott did not comment on. That was the very marked reaction to $\frac{1}{4}$ gr morphine sulfate. I have a recollection of giving morphine on one occasion to a patient with cirrhosis of the liver and of having the respirations stay below 10 for three successive days. Some of the house officers tell me that they too have noted marked reactions to morphine in cases of cirrhosis, and I wonder if that may not be regarded as an additional point in favor of cirrhosis in this case.

CLINICAL DIAGNOSES

Arteriosclerotic and hypertensive heart disease
Bladder tumor with metastases to the liver and peritoneum?

Cirrhosis of the liver?
Peritonitis?

DR. TALBOTT'S DIAGNOSES

Idiopathic cirrhosis of the liver
Arteriosclerosis
Primary carcinoma of the liver?

ANATOMIC DIAGNOSES

Cirrhosis of the liver, toxic
Ascites
Duodenal ulcer, chronic
Icterus, slight
Arteriosclerotic heart disease, slight
Arteriosclerosis, aortic, coronary and cerebral
Cholecystitis, chronic
Cholelithiasis
Nephritis, chronic vascular, bilateral.
Operative scars: empyema drainage, right chest, cystotomy

PATHOLOGICAL DISCUSSION

DR. MALLORY: We did find a marked atrophic cirrhosis. The liver weighed only 750 gm. It certainly could never have been felt. It was very granular. It did not show any fatty infiltration or hyaline degeneration that would enable us to identify it as alcoholic cirrhosis. I think we have to be content with saying that it was idiopathic or post-atrophic, which is almost the same thing. He had no cancer. The bladder was clean. These papillary tumors of the bladder histologically are almost always benign, but from the clinical point of view they usually behave as if they were carcinomatous. I feel quite hopeless in trying to guess whether one of these tumors is going to recur. In my experience no matter how benign they look they almost always come back, but here with no evidence of recurrence after fifteen years, I think we can say the lesion was cured.

The terminal event was hemorrhage which did not come from varices but from a large duodenal ulcer.

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NATIONAL SOCIAL HYGIENE DAY

FEBRUARY 2 will be observed throughout the nation as the second annual National Social Hygiene Day. February 3 was so observed last year. On the present occasion primary importance will be placed upon plans for furthering the national effort to stamp out syphilis, so ably sponsored and initiated by Dr. Parran in his National Conference in Washington in 1936. Since that memorable event, only those in position to know realize to what extent the public has accepted the leadership offered for accomplishing this end, to what degree plans are already laid for future activity, and what definite achievements can already be pointed to with pride. Soon these facts will be apparent to all. In Massachusetts, the State Department of Public Health, the Committee on Postgraduate Instruction of the Massachusetts Medical Society and

the Massachusetts Society for Social Hygiene have effectively joined forces for furthering this end.

Social hygiene work in Massachusetts is rapidly becoming well organized. The current activities are scheduled to cover a period of time both preceding and following February 2. On January 10 there was a thirty-minute broadcast on "Facing the Facts in the Control of Gonorrhea and Syphilis", on January 19 there was one on "Gonorrhea". On January 20, at Ford Hall, Dr. Stanley H. Osborn, commissioner of health of Connecticut, and Dr. Nels A. Nelson, of the Massachusetts Department of Public Health, discussed compulsory tests for syphilis before marriage. On February 2, Dr. Nelson will speak over station WORL in the morning and over a national hook-up from station WEEI in the evening.

The local social hygiene groups of Pittsfield, Holyoke, Springfield, Fitchburg and Cambridge are all planning meetings on National Social Hygiene Day in order to increase the interest and co-operation of the citizens in those communities.

The State Federation of Women's Clubs has taken up the control of syphilis for its health program. Under the able direction of Mrs. William T. Hanson, chairman of the Public Health Division, much of the radio publicity has been arranged, in addition to direction of activities among the local clubs.

The Social Hygiene Committee of the Boston Health League has assumed responsibility for several publicity projects built around National Social Hygiene Day. The co-operation of the Boston Health Department has been assured.

On two hundred billboards throughout Massachusetts have appeared posters bearing the legend, "Safeguard Baby's Right to be Born Healthy—Every Expectant Mother Should Go Early to a Physician for an Examination and Blood Tests." The outdoor-advertising companies are contributing to this educational project to aid in the control of congenital syphilis.

The Committee on Postgraduate Medical Instruction of the Massachusetts Medical Society, with the co-operation of the Massachusetts Department of Public Health, the United States Public Health

Service, the Federal Children's Bureau and representatives of the Massachusetts Society for Social Hygiene are painstakingly preparing, under the direction of a member of the Department of Education at Harvard University, illustrated courses which contain all the essential facts concerning the diagnosis, treatment and public-health aspects of syphilis and gonorrhea. These will be given in various districts throughout the State during the winter and spring and are open to all registered physicians. It is hoped that the major clinics in Massachusetts will be equipped, in the not too distant future, with teachers for the postgraduate instruction in these important public-health problems.

NATIONAL POLIOMYELITIS FOUNDATION

AN announcement has come from President Roosevelt of the plan to form a national foundation for the purpose of unifying the fight against infantile paralysis, according to a report in *Science*. The new foundation will be financed through a nationwide solicitation of private charities, with an expected goal of from \$7,000,000 to \$10,000,000 in the next five years.

The President has a particular interest in the battle against this crippling disease and has been president of the Georgia Warm Springs Foundation since it was first organized over ten years ago. In his own words, the time has now arrived when the whole attack on this plague should be led and directed, though not controlled, by one national body. This foundation will make every effort to ensure that every responsible research agency in this country is adequately financed to carry on investigations into the cause of infantile paralysis and the methods by which it may be prevented.

We may hope that the launching of this new great health foundation will indeed furnish a landmark in the constant struggle of science to control disease. Some of the most devastating of the scourges of mankind have been conquered by the toil of silent workers, sometimes with little assistance, sometimes with the aid of great founda-

tions. This particular disease—probably the first to become the focal point of an entire organization such as this will be—makes up in dramatic interest and emotional appeal what it lacks in actual epidemiologic importance.

The suddenness with which infantile paralysis strikes, reaching out to waste the limbs of those who have hardly yet had time to use them, makes it a disease more dread than rheumatic fever, which cripples so many more, or than pneumonia, which exacts a much higher toll of lives.

The country and the world will wish all success to the National Foundation for Infantile Paralysis, hoping that through its efforts better treatment for this disease will result, and more devoutly to be wished for, some means of real control such as have been given us for smallpox and diphtheria.

PAPERS FROM THE FAULKNER HOSPITAL

IN this issue of the *Journal* is the first of a series of papers submitted by the staff members of the Faulkner Hospital. Through an arrangement with the Board of Trustees of the hospital the *Journal* will publish a group of these papers quarterly, and each group will be reprinted in pamphlet form with a special cover. Physicians desiring to obtain copies are requested to write to Dr. James A. Halsted, Faulkner Hospital, 1153 Centre Street, Jamaica Plain.

OBITUARY

CHARLES MORTON SMITH

1867-1937

The sudden death of Dr. Charles Morton Smith on January 8 following an illness of only twenty-four hours, came as a shock to his many friends both in and outside the profession. Although previously he had experienced warnings of impending disease, yet he refused to spare himself, carried on his customary routine of practice, and preferred not to let it be known that he suffered any ailment.

Dr. Smith was born in Dublin, New Hampshire, and after adequate preparation in the public schools, entered the Harvard Medical School, from which he was graduated, cum laude, in 1894. He

served as surgical intern at the Boston City Hospital, following which he started as a general practitioner in Boston. He very soon took up dermatology and became an assistant to the late Dr. Abner Post. He then gave up general practice and devoted himself exclusively to the practice of dermatology and syphilis.

He served at one time on the dermatological staffs of the Boston City Hospital and the Boston Dispensary. It was his early ambition to gain a thorough knowledge of syphilis and to become known as a specialist in that disease, and certainly that ambition was realized when in later years, together with Dr. Post, he organized the Department of Syphilis at the Massachusetts General Hospital and was appointed clinical professor of syphilology at the Harvard Medical School. His teaching and practice helped to stimulate the modern conception and advance in the diagnosis and management of venereal disease. He was among the first to appreciate the value of the Wassermann reaction in the diagnosis of syphilis and the use of arsphenamine in treatment.

He was a member of the national and state medical societies, and was affiliated with the American Dermatological Association and the New England Dermatological Society, as well as other smaller organizations. He was alert to everything that was progressive in medicine, especially in the field of dermatology.

Dr. Smith's personal devotion to the welfare of his patients was unusual. He spent much time in listening to the history of their ailments, and was equally painstaking in their subsequent care and treatment. He had a genial and kindly disposition so that he at once won their confidence and co-operation. He was most efficient in every way, and as a result, many of his patients became his grateful and lifelong friends.

One of his diversions was the care of a garden at his summer home in North Scituate, in which he did most of the work himself, even after he had been given warnings of failing health. Flowers and vegetables from this garden were generously distributed among his more intimate friends. He was a member of the Hatherly Country Club, and at one time attained considerable proficiency in golf.

He had an ear for good music, and a taste for everything that was artistic. Because of his keen sense of humor, he thoroughly appreciated a good story or a good joke. He was a most agreeable companion and a gracious host. Kindness, fairness, and good judgment were apparent in all his activities. Whatever he undertook to do was carried through in a thorough manner.

J L A

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No. 56 PREMATURE SEPARATION OF PLACENTA AT SEVEN AND A HALF MONTHS

Mrs. D., aged thirty-nine, seven and a half months pregnant, was seen in consultation on February 13, 1928. About two hours before admission to the hospital the patient was seized with a sudden, sharp pain in the abdomen, followed by a gush of blood from the vagina. The severe pain was succeeded by a "dull ache and tense feeling" in the abdomen and lower back. Moderate flowing, with faintness and dizziness, continued, but there was no loss of consciousness. She was then transferred to the hospital.

The family history and the patient's past history were negative. There is no record of catamenial history as the patient was seen in consultation with a doctor who is now deceased. She had had four full-term deliveries, the first a forceps delivery and the others normal. The children were all living and well, and there had been no miscarriages. In 1926, a colpoperineorrhaphy, appendectomy and uterine suspension were performed.

This pregnancy was uneventful until January 1 when a moderate albuminuria and slight rise of blood pressure were noted. The usual treatment was instituted: rest and restriction of proteins and salt, with saline catharsis. Observation during this period disclosed no increase of albumin, and the blood pressure persisted between 140 systolic, 40 diastolic and 150 systolic, 100 diastolic.

The patient was a well-developed and nourished woman, who was conscious and rational but very anxious and apprehensive. There was marked pallor of the skin and mucous membranes. The heart showed no enlargement, there were no murmurs. The blood pressure was 146 systolic, 96 diastolic. The lungs were clear and resonant, there were no rales, and the respirations were 28 per minute. Her temperature was 97.8°F., and the pulse 126. The abdomen was distended by a pregnant uterus rising to four fingers below the ensiform. There was extreme tenderness over the entire uterus, with that tense, ligneous quality of the uterine wall which is observed in many cases of severe accidental hemorrhage. The fetal heart was heard in the right lower quadrant, faint and irregular, the

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

rate ranged from 108 to 134 beats per minute. There was a moderate but continuous flow of blood.

Rectal examination showed that the cervix was one-finger dilated and was partly effaced with the vertex presenting and high. By pressure on the fundus, the head could be forced firmly against the cervix and no placental tissue could be felt. There was slight edema of the ankles.

Urinalysis showed a specific gravity of 1.018, there was no sugar, and a trace of albumin. The sediment containing few red cells and no casts. A blood examination showed a red-cell count of 3,690,000, a white-cell count of 8400 and a hemoglobin of 55 per cent.

Conservative care was considered and rejected. The symptoms were so severe that a sanguineous infiltration of the myometrium was suspected. This might prevent postpartum contraction and result in fatal hemorrhage after delivery.

A low cervical cesarian section and supravaginal hysterectomy were then performed under nitrous oxide and oxygen anesthesia with a small amount of ether. About a liter of serosanguineous fluid was found free in the peritoneal cavity. The uterus was dark purple with many ecchymotic areas mottling its surface. The operative area was walled off, the vesicouterine fold of the peritoneum incised transversely and the bladder stripped off the lower uterine segment. The latter was then incised longitudinally and a small, living baby extracted. The placenta was detached over two thirds of its surface. The uterine wall at the line of incision, in spite of its location, was twice as thick as usual and so spongy and friable that the sutures would not hold. Frothy blood oozed freely from the cut edges. This condition, with the fact that the boggy, hemorrhagic uterus would not contract, made hysterectomy imperative. The uterus was quickly removed in the usual manner. Almost the entire cervix was exposed before firm tissue, which could be sutured, was reached. The cervical stump was suspended and peritonealized and the abdomen closed in layers without drainage. Glucose and saline solutions were administered intravenously and per rectum.

The pathologist's report was as follows: The uterus was 12 cm long, 10 cm laterally, 5.5 cm anteroposteriorly, the organ was deep red. An incision 7 cm long was present in the midline of the lower portion of the anterior wall. The surface of the uterus showed diffuse subperitoneal hemorrhage. On opening, the canal was 9.5 cm long and dilated, the anterior surface of the right side was covered by a thick layer of recent clot. Microscopic examination showed the muscle fibers separated and the lymphatics distended and empty. The veins were dilated, some were filled with blood. About many of these distended vessels

the surrounding tissues were filled with blood, this was notably so in subperitoneal regions. Many of the smaller veins contained numerous polymorphonuclear leukocytes. The muscle fibers were hypertrophied, some were swollen, almost hyaline in appearance and showed no nuclei.

The patient made a good recovery. The blood pressure and urine were normal after the fifth day, and she was discharged fifteen days after operation. At birth the baby weighed 3 lb, 11 oz. and was gaining when discharged. When seen six weeks later the mother was in excellent health. The cervical stump was high, and the pelvis clear.

Comment. A diagnosis of premature separation of the placenta is made by some external bleeding, the tightness of the uterus, the absence of the fetal heart (if the placenta is entirely separated), and the condition of the patient from hemorrhage entirely out of proportion to the amount of blood lost externally. It is in the case of the partially separated placenta, when the baby is known to be alive, that differential diagnosis is often difficult. In such cases, a vaginal examination ruling out placenta previa of any type is the method of arriving at a correct diagnosis. If a placenta is felt, the patient has a placenta previa, if no placenta is felt, the patient has a separated placenta. The treatment of cases such as this one usually depends upon whether the patient is in labor. If, on examination, one finds the cervix taken up and partially dilated, rupturing the membranes and applying some sort of fundal pressure is the conservative operation. At seven and a half months one must realize that the safest procedure for the baby is cesarian section, but one must also appreciate that a seven and a half months' baby, even if born alive, has a definite chance of dying from prematurity. If the patient is not in labor, and the baby viable, cesarian section is the operation of choice, and if, as in this case, the operator feels that the uterus is one that may demand removal the abdominal route is the only way to treat the condition. In all severe bleeding cases, let it be remembered that transfusion is often necessary and that a donor should be on hand in every case.

COMMITTEE ON STATE AND NATIONAL LEGISLATION

As of January 10, the committee reports on the following bills

CLASS ONE

Bills introduced for the society

1 AN ACT regulating the sale of aminosulfamidobenzene and dinitrophenol

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1 Chapter two hundred and seventy of the

General Laws, as appearing in the Tercentenary Edition, is hereby amended by inserting after section two A the following new section

Section 2B Whoever sells aminosulfamido-benzene or any chemical combination, compound or derivative thereof, or dinitrophenol or any chemical combination, compound or derivative thereof, without the written prescription of a physician shall be punished by a fine of not more than fifty dollars. This section shall not apply to sales made by wholesale dealers or manufacturing chemists to retail dealers, or to sales of the above articles for non medicinal purposes.

Comment This bill has not yet received a number of conferences have been held with the legislative committees of the Retail Druggists Association, the Massachusetts Central Health Council, the Boston Health League, and the State Department of Public Health. They will all support this bill.

* * *

2. AN ACT requiring the clerk or registrar of each city or town to give to each person, who files notice of intention of marriage, suitable information concerning gonorrhea and syphilis.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows

SECTION 1 Chapter two hundred and seven of the General Laws, as appearing in the Tercentenary Edition, is hereby amended by inserting after section twenty the following new section

Section 20A The clerk or registrar who administers the oath, as provided in the foregoing section, shall hand to each person to whom said oath is administered such literature, concerning gonorrhea and syphilis and the importance of premarital examination, as may be furnished for that purpose by the State Department of Public Health.

SECTION 2 Chapter two hundred and seven of the General Laws, as appearing in the Tercentenary Edition, is hereby further amended by inserting after section fifty two the following new section

Section 52A Whoever violates any provision of section twenty A shall be punished by a fine of not more than one hundred dollars

Comment This bill is introduced following a conference with leading specialists. It is likely that one or more bills requiring compulsory examination for syphilis will be introduced this year. It is believed by excellent authority that such acts would probably produce much less in the way of important good results than their proponents expect. If an obviously unworkable bill is introduced it might easily put the profession in a false position if it tried to oppose it or even if it ignored it. It is quite possible that a noncompulsory bill such as this would accomplish as much good as a compulsory bill. The State Department of Public Health will support us in this bill and will oppose any compulsory bill that it has seen as yet.

CLASS TWO

Bills introduced by others but recommended to the Council for support

1. House Bill No. 39 AN ACT relative to the meaning of the terms "rendering medical service," "practice of medicine" and "holding one's self out as a practitioner of medicine."

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows

Chapter one hundred and twelve of the General Laws, as appearing in the Tercentenary Edition thereof, is hereby amended by inserting after section five the two following new sections

Section 5A For the purposes of sections two to twelve A, inclusive, rendering medical service shall constitute the practice of medicine and shall include any treatment of one person by another, by the use or misuse of any means, for the purpose of diagnosing, preventing, relieving or curing any deviation from normal condition of mind or body, or for the purpose of preventing, diagnosing or interfering with pregnancy

Section 5B For the purposes of sections two to twelve A, inclusive, a person shall be regarded as holding himself out as a practitioner of medicine if he announces to any other person or to the public, a desire, willingness or readiness to practice medicine either directly by his own acts or indirectly through the acts of a servant or agent or if he opens an office for the practice of medicine, or if he appends to his name M.D., M.B., Dr., Doctor, Physician, Surgeon, Healer, Specialist, or any other title word or letter tending to suggest or designate him as a practitioner of medicine in any of its branches.

Comment The Board of Registration in Medicine feels that this definition will make the conviction of illegal practitioners more certain when they are brought into court.

* * *

2. House Bill No. 40 AN ACT to exempt dentists, optometrists and chiropodists (podiatrists) in certain cases from the penalties provided for the unlawful practice of medicine.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows

Chapter one hundred and twelve of the General Laws, as appearing in the Tercentenary Edition thereof, is hereby amended by adding in line nineteen of section seven, the following sentence. They shall not apply to dentists, optometrists or chiropodists (podiatrists) when duly registered by their respective boards of registration and practicing as authorized by their certificates of registration, — so as to read as follows

Section 7 Sections two to six, inclusive, and section eight shall not be held to discriminate against any particular school or system of medicine, to prohibit medical or surgical service in a case of emergency, or to prohibit the domestic administration of family remedies. They shall not apply to a commissioned medical officer of the United States army, navy or marine hospital service in the performance of his official duty, to an interne or medical officer registered as provided in section nine, while engaged in the practice of medicine as authorized by said section, to an assistant in medicine registered as provided in section nine A, while engaged in the practice of medicine as authorized by said section, to a physician or surgeon resident in another state who is a legal practitioner therein, when in actual consultation with a legal practitioner of this commonwealth, to a physician authorized to practice medicine in another state, when he is called as the family physician to attend a person temporarily abiding in this commonwealth, nor to registered pharmacists in prescribing gratuitously, clairvoyants or persons practicing hypnosis, magnetic healing, mind cure, massage, Christian Science or cosmopathic method of healing, if they do not violate any provision of the preceding section. They shall not apply to dentists, optometrists or chiropodists (podiatrists) when duly registered by their

respective boards of registration and practicing as authorized by their certificates of registration.

Comment This amendment would prevent the possible prosecution of dentists, optometrists and chiropodists for practicing medicine so long as they stay in their own fields.

* * *

3 House Bill No 42 AN ACT relative to the revocation or suspension of certificates of registration to practice medicine and to the cancellation of such registration.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows

Section two of chapter one hundred and twelve of the General Laws, as most recently amended by sections one and two of chapter two hundred and forty-seven of the acts of nineteen hundred and thirty six, is hereby further amended by striking out the fourth and fifth sentences, as appearing in the Tercentenary Edition, and inserting in place thereof the following

The board after hearing, may revoke any certificate issued by it and cancel the registration of any physician convicted of a felony, and may subsequently but not earlier than one year thereafter, reissue any certificate so revoked, and register anew any physician whose registration was so cancelled. The board after hearing, may suspend any certificate issued by it and cancel for a period not exceeding one year, the registration of any physician, who has been shown at such hearing to have been guilty of gross and confirmed use of alcohol in any of its forms while engaged in the practice of his profession, or of the use of narcotic drugs in any way other than for therapeutic purposes, or abuse of the authority granted in section two hundred and nine A of chapter ninety-four, or of publishing or causing to be published, or of distributing or causing to be distributed, any literature contrary to section twenty nine of chapter two hundred and seventy-two, or of acting as principal or assistant in the carrying on of the practice of medicine by an unregistered person or by any person convicted of the illegal practice of medicine or by any registered physician whose license has been revoked either permanently or temporarily, or of aiding and abetting in any attempt to secure registration, either for himself or for another, by fraud, or, in connection with his practice, of defrauding or attempting to defraud any person.

Comment This bill is of technical interest only. There is a conflict in two sentences in the present law, one of which allows the Board to suspend a license for a short period as a penalty for certain crimes, but the other of which does not allow the restoration of a suspended license until the next calendar year.

* * *

4 House Bill No 43 AN ACT relative to the qualifications for membership on the Board of Registration in Medicine.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows

Section ten of chapter thirteen of the General Laws, as amended by chapter eight of the acts of nineteen hundred and thirty two, is hereby further amended by striking out, in lines nine to eleven, inclusive, the words "and no more than three members thereof shall at one time be members of any one chartered state medical society;"—so as to read as follows

Section 10 There shall be a board of registration in

medicine, in the two following sections called the board, consisting of seven persons, residents of the commonwealth, registered as qualified physicians under section two of chapter one hundred and twelve, or corresponding provisions of earlier laws, who shall have been for ten years actively engaged in the practice of their profession. No member of said board shall belong to the faculty of any medical college or university. One member thereof shall annually in June be appointed by the governor, with the advice and consent of the council, for seven years from July first following

Comment This bill removes the restriction in regard to medical society membership that may have been important when there were active homeopathic and eclectic societies, but is only a nuisance at the present time.

CLASS THREE

Bill presented to the Council for action

House Bill No 41 AN ACT to require annual licensing of qualified physicians

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows

Chapter one hundred and twelve of the General Laws, as appearing in the Tercentenary Edition thereof, is hereby amended by inserting after section four the two following new sections

Section 4A Every person registered as a qualified physician, who is engaged in the practice of medicine within the commonwealth, shall annually in December transmit to the board a license fee of one dollar together with a statement made on a blank furnished by the board at his request and signed by him under the penalties of perjury, giving his name, his registration number, the date of his registration, his professional address and such other information concerning his medical education as the board may require, provided that such statement may be so transmitted at any time prior to April first upon the payment of a license fee of one dollar together with a further fee of one dollar for each month or part thereof that he is in default, and provided further that every registered qualified physician who withdraws from the practice of medicine within the commonwealth shall be exempt from transmitting such license fee or statement during the time of such withdrawal if he notifies the board in writing of such intended withdrawal. After such a withdrawal and prior to re-entering the practice of medicine within the commonwealth, every qualified registered physician shall transmit to the board a license fee of one dollar and the statement aforesaid. The board shall give to each qualified registered physician transmitting the fee and statement hereunder a certificate stating that he has complied with the provisions of this section and he shall display such certificate continuously in a conspicuous place in his office during the period covered by such certificate. Every person registered by the board as a qualified physician, who is engaged in the practice of medicine within the commonwealth, shall notify the board promptly of any change of his professional address, giving his new address in writing. Whoever, being duly registered under section two or corresponding sections of earlier laws, practices medicine or holds himself out as a practitioner of medicine within the commonwealth without complying with the requirements of this section, shall be punished by a fine of not less than five nor more than one hundred dollars.

Section 4B On the first day of March of each year the board shall publish a list of the qualified registered physi-

cians who have transmitted the fee and statement required by section four A during the preceding December, giving the name of each such physician, his registration number, the date of his registration, his professional address, and such other information as is specified in section four A, and shall send a copy of such list to each such physician, and to each town clerk, chief of police, board of health, hospital and registered pharmacy in the commonwealth.

Comment This bill was introduced by the Board of Registration in Medicine. There is considerable sentiment among some members of the committee that a proper bill for annual registration of physicians may be useful to the Board and not harmful to the profession. Also there is belief that annual registration may be passed some time whether we oppose it or not. We also believe that this bill is better than last year's bill. But, we oppose the provision for transmitting yearly to the board such other information concerning his medical education as the board may require. We also believe that the Board has not yet proved that annual registration is necessary by making such a survey of the problem of the unlicensed practitioner that the magnitude and seriousness of the problem can be estimated.

In the opinion of the committee there is no guaranty that the money collected under the terms of this bill would be available to the Board for carrying out the provisions of the bill.

CLASS FOUR

Bills recommended to the Council for opposition

Senate Bill No. 40 (actual wording omitted)

Comment. This is a bill to regulate the giving of transfusions. It has as its purpose the prevention of the transmission of syphilis to recipients of blood transfusions. It would entail reports on blood serologic tests of recipient and donor in the case of each transfusion, to be sent to the State Department of Public Health. The committee does not believe that this is a serious enough problem to make such legislation desirable.

* * * * *

In regard to national legislation we know of no immediate matters except that on July 28, 1937, the following resolution was introduced into the United States Senate by the Honorable J. H. Lewis, of Illinois. This has not yet come out from the Finance Committee.

AN ACT to provide medical aid for the needy and the stricken with illness who are unable because of poverty to provide treatment and hospitalization, also to establish all licensed medical practitioners as civil officers of the National Government.

Whereas the Federal Government has recognized its social responsibilities to its citizens by the enactment of the Social Security Act, and

Whereas an extension of such responsibilities is necessary to provide adequate medical care and attention for the impoverished and needy to assure the full enjoyment of social security, therefore be it

RESOLVED BY THE SENATE AND HOUSE OF REPRESENTATIVES OF THE UNITED STATES OF AMERICA IN CONGRESS ASSEMBLED, That all physicians and surgeons who practice the profession of medicine or surgery in the United States or its Territories are hereby declared to be civil officers of the United States for the purposes of this joint resolution.

Sec. 2. Any such physician or surgeon shall render such medical or surgical aid requested of him by any impoverished individual who is in need of such aid, and, where necessary, to order the hospitalization of any such individ-

ual. Any hospital to which such an order is directed shall, insofar as its facilities permit, provide for the hospitalization and care of any such individual in the manner best adapted to accomplish his recovery.

Sec. 3. Any physician, surgeon, or hospital rendering aid to impoverished individuals as provided in section 2 is authorized to make such charges for such aid as are reasonable and just. Bills for such charges shall be submitted to the Social Security Board, which is authorized and directed to pay them, under such rules and regulations as it may prescribe.

Sec. 4. (a) It shall be unlawful for any physician, surgeon, or hospital official or employee to refuse to render aid as provided for in this joint resolution, or to make exorbitant or excessive charges for such aid, or to make any charge against an individual to whom aid has been rendered in addition to the charge paid by the Social Security Board.

(b) It shall be unlawful for any person fraudulently to represent that he is impoverished for the purpose of receiving aid under this joint resolution.

(c) Any person violating any of the provisions of this joint resolution shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than \$1,000, or imprisoned not more than three months, or both.

Sec. 5. The Social Security Board shall have power to make such rules and regulations as may be necessary to carry out the provisions of this joint resolution.

Sec. 6. There is hereby authorized to be appropriated such sums as may be necessary to carry out the provisions of this joint resolution.

Comment The committee wishes to oppose this resolution by having the Council pass the following resolution which is similar to one recently passed by the Illinois State Medical Society

WHEREAS, Senate Joint Resolution 188, introduced on July 28, 1937, in the Senate of the United States by Senator J. Hamilton Lewis, of Illinois, proposes to federalize the medical profession of the nation, making every licensed physician and surgeon a civil officer and subject to prosecution and penalization in the federal courts for special causes enumerated in the resolution, and

WHEREAS, Such action being clearly a case of class legislation is contrary to the principles of constitutional government and

WHEREAS, The obligation imposed by the Joint Resolution upon each licensed physician of rendering needed medical service to any and all impoverished who make application to him would inevitably overwhelm practitioners of outstanding reputation, create the necessity of elaborate machinery to determine who would qualify as impoverished or in lieu thereof open the way for fraudulent practices, political interference and tend to lower the standards of medical practice, and

WHEREAS, The authority reposed by the Joint Resolution in the Social Security Board would lead almost certainly to fee fixing by governmental agencies and would necessitate a nation wide accounting and investigating system that would add a tremendous indirect cost to the nation's bill for medical care and

WHEREAS, The penalties imposed by the Joint Resolution on persons who violate the provisions thereof are so exorbitantly severe as to create a detrimental and inimical psychology in the medical profession and

WHEREAS, The proposed plan would lend itself easily to political abuse and become a stepping stone to communistic and socialistic government, and

WHEREAS, Poverty itself is the fundamental cause of most

of the ills which the Joint Resolution seeks to cure and prevent through the superficiality of a superimposed medical service, and

WHEREAS, The enforcement of local laws already on the statute books would provide as adequately for the sick-poor as modern facilities and circumstances make practicable, and

WHEREAS, The needy now enjoy as adequate medical care as economic limitations and the vagaries of human nature would make possible under the proposed plan, therefore it be

RESOLVED BY THE COUNCIL OF THE MASSACHUSETTS MEDICAL SOCIETY IN REGULAR SESSION ASSEMBLED, That Senate Joint Resolution 188 is inimical to the best public interests, is un-American and unworkable, would result in monumental expenses without yielding compensating benefits, would lead to political corruption and tyranny and ought to be defeated, and, be it further

RESOLVED, That copies of these resolutions be forwarded to the President of the United States, to each Senator and Representative in Congress from Massachusetts and to the secretaries of the medical societies of the several states

CARE OF THE HAIR

Hair is the common right of all of us, along with life, liberty and the pursuit of happiness. It is defined in various ways, perhaps as 'woman's crowning glory,' perhaps in the highbrow manner of the dictionary as "the characteristic outgrowth of the epidermis forming the coat of mammals." But in spite of various definitions, we all know what hair is and are interested in it, especially so in keeping what we have, as we grow older. I wish, therefore, to say something about the composition of hair, about some of the things which affect its growth, and how to keep it healthy.

A hair is a slender solid thread of many layers of cells, containing a horny substance like that in the finger- and toenails, and in the outer layer of the skin. This thread starts from a small elevation at the very bottom of a tiny tube called the hair follicle. In the wall of each follicle are the openings of two or three oil glands which supply the hair and scalp with the amount of oil they need.

Hair was given to us to protect us and to make us more attractive. Hair was undoubtedly developed as a necessity in protecting ancient man in his struggle for existence in the cold regions of prehistoric times. This was centuries before we began to cover ourselves with clothes. Nowadays, as a feature of personal beauty, especially if it is vanishing, hair has become one of man's and woman's most cherished possessions. But hair is still in use as a protection, for to many of the modern youth the ownership of a hat is a rare occasion.

As you look at people's hair, you cannot help being impressed with the differences in amount and by the differences in color. So also is there considerable variation in texture, in the amount of oil or dryness present, in the amount and type of scaling, in its luster, and so forth. The factors which control or influence these variations are not definitely known. The kind of hair our parents and grandparents had, or the lack of it, accounts for some of these variations. Certain illnesses also cause changes in the scalp and hair, and an examination of the scalp will often tell the physician a great deal about the general health of its owner. We are finding that some of the internal glands and the way that these glands act upon each

other may have much to do with the growth of hair. Improper care or neglect, or of too much sun, may produce changes in the hair and scalp. Differences in the scalps of different people and the many possible causes of trouble with hair make it almost impossible to lay down any general rules for the care of the hair. There are, however, certain general points that can be applied to everybody.

Scalps, of course, need cleansing just as much as the rest of the body does, but how often depends upon what kind of a scalp you have. Regular washing with soap is a necessity, the interval varying with the individual scalp and perhaps measured more by the amount of dirt accumulated and the amount of dryness or oiliness than by any other factors. The average mild soap is satisfactory to most skins, while for very oily scalps tincture of green soap or a tar or sulfur soap is somewhat better. Thorough rinsing and drying are not only desirable but necessary.

Excessive dryness after the shampoo may be overcome by the rubbing into the hair of a small amount of oil, or perhaps using a mixture of alcohol and a little castor oil, the alcohol evaporating and leaving the oil upon the hair. The amount of oil to be used will depend, of course, upon the degree of dryness of the individual scalp.

Combs and brushes should be cleaned at frequent intervals. Do not forget that combs and brushes are intimate personal property and are not for use by other members of the household. In the best combs the teeth are smooth and wide apart, and their tips should be blunt. Metal combs, if well made, have an added advantage—they can be boiled and so sterilized.

Brushing is almost a forgotten art in these days of modern high speed living. But it should not be forgotten because it aids in cleansing and provides a certain amount of stimulation to the scalp and to the oil glands. The brush should be a moderately stiff one and not used with sufficient pressure to irritate the skin. Rhythmic repeated stroking with a brush is really another kind of massage of the scalp.

Many scalps are stretched tightly over the skull, and there is very little slide to such a scalp when you try to move it. Usually in this kind of a scalp the blood supply is not so good as in the persons with a loose scalp in which there is a thicker body of tissue between the bone and the skin. Such individuals need more frequent mechanical stimulation by brushing or massage in order to bring a better supply of blood to the scalp.

I have said that different people have different amounts of oil. Usually there is an excess of oil in young people. As the individual becomes older this excessive oil gland activity becomes less, although there are numerous people in whom an excess of oil persists throughout life. With the latter, of course, more frequent shampoos are advisable, and possibly a somewhat stronger soap. Those persons with a persistent dryness of the scalp or skin can cope with their problem by reversing this procedure, that is, they need to shampoo less often, using a milder soap with possibly a little oil worked into the scalp from time to time.

There are many diseases of the skin which can occur upon the scalp and some which involve only the hairy areas. It can be said of the scalp, as of any other part of the body, that the best preventive of disease is to maintain good general health and provide the proper and painstaking cleanliness for the type of hair and scalp you happen to be blessed, or cursed, with.

* * *

A Green Lights to Health broadcast given by Dr. C. Guy Lane on Wednesday January 5 and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

Q You have not said anything about falling out of the hair. What causes it, and what can be done about it?

A. Falling out of the hair is a matter of considerable concern to many of us. Under normal conditions there is always some replacement since new hairs grow in where the old ones fall out. There are many types of hair loss, with many causes, and very often we are unable to find the exact cause. The parents or grandparents are frequently blamed and there is no doubt of a hereditary factor, but whether that factor lies in the scalp itself or has something to do with the internal glands, we are not sure. Disease in other parts of the body, either general or local, either acute or chronic, may have a very definite effect in producing hair loss. Local diseases of the scalp often result in hair loss which may be permanent, and sometimes scars are left. Curiously enough, certain diseases, even when severe, have practically no effect in producing a decrease in the amount of hair. Dandruff—so-called—in its numerous types may be the cause of a later loss of hair. Over-exposure to the sun and the continual daily wetting of the hair are considered to be responsible for some cases of baldness. In spite of all that is known, in numerous individuals with falling hair we cannot discover why it falls, even after careful investigation.

The variety of baldness which appears in middle age and beyond, which is characterized by gradual thinning of the hair on the top of the head and above the temples, is thought to occur as a result of changes in blood vessels and the lower layers of the skin which come as we grow older. The outlook in such cases is not good, particularly if your father or mother had the same trouble. There is no medicine you can take internally that will help, but attention to general health and local stimulating measures and massage will be more effective than anything else. Man's desire to retain this last vestige of his former glory has resulted in the invention and patenting of all sorts of hair restorers and other devices to prey upon this desire, but they have little to commend them so far as actual results are concerned.

Q After an illness accompanied by fever is falling hair a serious symptom?

A. No. Usually the hair will regrow as the person regains his strength and vitality.

Q I have a young friend whose hair is rapidly turning white. Can she safely have her hair dyed?

A. The agents usually employed for dyeing hair may produce an irritation of the skin, usually about the hair border on the face or neck. Most individuals are not sensitive to these dyes and such persons will suffer no inconvenience from their use. It is always advisable to have the dye tried first on a small area of the skin where there is no hair before allowing its application. If any irritation of the skin develops from this test, or upon use of the dye on the hair, do not use it any more.

Q You have mentioned dandruff. Will you tell me what it really is?

A. Dandruff is a term usually applied to any type of scaling in the scalp. It is a major problem for many people. Some little scaling is present in everyone. An abnormal amount may consist of many dry fine scales, or perhaps may be present in the form of thick greasy and possibly adherent scales. It may be all over the head, or appear in a few small patches. Such scaling may be the result of some inflammatory condition of the oil glands of the scalp or may be caused by some other disease of the scalp or by a diseased condition in another part of the body. No special germ has been found in all cases as a cause, in spite of glowing advertisements to the contrary. Many germs are found in the scalp, but it is hard to tell if they cause trouble or appear after trouble has started.

Q Does the sun actually inflict damage upon hair?

A. Yes. Over-exposure to the summer sun may dry out the hair and in certain instances, especially in the blonde types, may cause the hair to fall out. A moderate amount of sun or of artificial ultraviolet light, however, is very beneficial, in my opinion.

Q Does the addition of egg to the shampoo help any?

A. There may be a temporary gloss, and perhaps it renders the hair less dry for a while, but a small amount of oil is somewhat better.

Q Can you tell me whether the effect of a permanent wave is apt to be harmful to the hair?

A. The Bureau of Standards has found that excessive heat lowers the breaking strength of hair. The temperature applied in carefully administered permanent waves is below this critical point, and the hair should suffer no harm. Occasionally a burn is produced by a careless operator. Certain solutions are also used but in general they are not injurious. Individuals with very fine and quite dry hair should not have permanent waves so often as other persons.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning January 31.

BRISTOL NORTH

Thursday, February 3, at 4 00 p. m., at the Morton Hospital, Taunton. Subject: Complications in Obstetrics, Illustrated by Case Histories. Instructor: James C. Janney. Arthur R. Crandell, *Chairman*.

BRISTOL SOUTH (New Bedford Section)

Friday, February 4, at 4 00 p. m., at St. Luke's Hospital, New Bedford. Subject: Early Syphilis. Instructor to be announced. Robert H. Goodwin and Howard P. Sawyer, *Chairmen*.

ESSEX SOUTH

Tuesday, February 1, at 4 00 p. m., in the Nurses Home, Salem Hospital, Salem. Subject: Rheumatic Infection, Rheumatic Heart Disease. Instructor: Edward F. Bland. Walter G. Phippen, *Chairman*.

MIDDLESEX EAST

Tuesday, February 1, at 4 00 p. m., at the Melrose Hospital, Melrose. Subject: Bleeding in the Last Trimester of Pregnancy. Instructor: Robert L. DeNormandie. Joseph H. Fay, *Chairman*.

MIDDLESEX NORTH

Friday, February 4, at 7 00 p. m., at St. John's Hospital, Lowell. Subject: Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor: Burton E. Hamilton. William S. Lawler, *Chairman*.

NORFOLK SOUTH

Monday, January 31, at 8.30 p. m., at the Quincy City Hospital, Quincy. Subject: Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor: Samuel A. Levine. David L. Belding, *Chairman*.

PLYMOUTH

Tuesday, February 1, at 4 00 p m, in the Rosa Field Nurses' Residence, Brockton Hospital (rear of hospital), Brockton. Subject Gonorrhea in the Male. Instructor George C Prather Walter H. Pulsifer, *Chairman*

WORCESTER (Milford Section)

Thursday, February 3, at 8 30 p m, in the Nurses' Home of the Milford Hospital, Milford. Subject Cesarean Section, Analgesia Instructor Joseph W O Connor Joseph Ashkins, *Chairman*

WORCESTER NORTH

Friday, February 4, at 4 30 p m, at the Burbank Hospital, Fitchburg Subject Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor William D Reid. Edward A Adams, *Chairman*

NEW HAMPSHIRE MEDICAL SOCIETY

GREETINGS AND BEST WISHES

May our Society grow, and increase in all that is Good,
May our Institutions give a larger measure of Service,
May our Efforts for the Improvement and Advancement
of Medicine and Public Health, for the Welfare of the
Sick in Soul, and Sick in Body, bear Fruit as never
before,

This is our New Year Message.

HISTORICAL NOTES

The New Hampshire Medical Society is the fourth oldest in the United States The three older are Delaware, New Jersey and Massachusetts

* * *

The following note appeared in the November, 1838, issue of the *American Journal for Medical Sciences*

At the annual meeting of the N H Medical Society, holden June last, it was voted that this Society recommend an Annual National Convention, to consist of Delegates from the various Medical Schools and Societies in the Union, that the first Convention be proposed to be holden AD 1840, and that the Secretary send a notice of this vote to the *Boston Medical & Surgical Journal* and the *American Journal of Medical Sciences* at Philadelphia

JAMES B ABBOTT,
Secy N H. Med Society

Boscawen, Oct., 1838

* * *

Most doctors in the old days were forced to dispense drugs, some of which they grew in their own herb gardens. The available remedies were fewer in number, but this was made up by the amount used Kelley lists the drugs most commonly used, among which are calomel, tartar emetic, jalap, rhubarb, gentian root, chamomile flowers, tartaric acid and Burgundy pitch He quotes Carr, a country doctor with an average practice, as saying that he used one hundred pounds of Peruvian bark (cinchona) in a year

* * *

The first symphysiotomy in New Hampshire, and very likely the first in the United States, was done in Barnstead

in 1833 Prof C D Meigs said the operation had never been done in America. Sigault in 1768 proposed the operation, and in 1777 performed it on Mme. Souchet. The patient and her baby lived, though she had a permanent vesicovaginal fistula, fecal incontinence and difficulty of locomotion Sigault, however, received a gold medal for his enterprise. Churchill (*Am J M Sc* 45 172, 1838) reported on the results of the operation before the Surgical Society of Ireland in 1838 He collected two hundred and forty cases from the literature, but no American case. However, Dr Thomas Shannon, of Pittsfield, and Dr Simon Woodward, of Barnstead, did this operation on the wife of Dr Woodward (*Tr N H. Med. Soc.*, 1893, p. 16) The division of the symphysis was so complete that the baby's scalp was injured. However, both mother and child recovered

* * *

"We hear that Dr Waterhouse has received the matter of the cow pox from England, and that inoculation has succeeded in one of his children Upwards of 30 000 persons of all ages, in England, have passed through this disease." *Columbian Phoenix*, July, 1800

* * *

Dr Nathaniel H. Scott of Wolfeboro, fifty years a member of the New Hampshire Medical Society, was presented the gold medal at the June, 1937, anniversary In Dr Scott's practice occurred the first three cases of psittacosis, recognized as such in the United States. Dr Herman Vinkery saw the patients in consultation, made the correct diagnosis, and described the cases for the *Boston Medical and Surgical Journal*

BOARD OF REGISTRATION IN MEDICINE

The death of Dr Charles Duncan left the office of secretary treasurer vacant. Dr Fred E. Clow was elected to the position, and Dr Charles W Adams generously consented to continue as a member of the board. Three formal meetings of the board, and several informal ones, have been held The number of men licensed has exceeded that of any previous year An amendment to the Medical Practice Act requiring a one year internship took effect on January 1

The following have recently been granted registration certificates after examination

Francis Appleton
Herbert B Henderson
Louis Phillippe Gagnon
Louis Theobald
Joseph Clough
David W Barrow
Edward F Yurkanis
Jos Carroll McCarty
Phillipe J Cote
Daniel Jos Sabia
Wm. Plummer Clough, Jr
Donald J Flanagan
Claire Priscilla Myron
Alfred Lawrence Pimental
Lloyd Leslie Wells
Robert E. Maxwell

No candidate was failed this year

The following have been licensed by reciprocity

Celia Alma McNecley	New York
Herman Burian	Jugoslavia
Fred Ashley Almqvist	Vermont

Carl Oscar Louis Collin	Massachusetts
Percy Chandler Grigg	Pennsylvania
Robert T Terry	Missouri
Abraham Teitelbaum	New York
Israel Dinerman	Illinois
James G Bogle	Massachusetts
John B McKenna	"
Justin F Grant	"
Duncan M. Chalmers	"
Edward Lawlor	"
Richard Backus	Vermont
Gerhard Golm	New York
Madison Brown	Vermont
Addison Roe	New York
Lester Whitaker	Massachusetts
Wilhelm Perlstein	Prussia (German Reich)
Samuel J King	Massachusetts
Thomas Walker	New York
Cornelia Walker	"
Lorne A MacLean	Canada (Quebec)
Wm. Endicott Greer	Massachusetts
Bernard Gagnon	Maine
Violet M Crabbe	Michigan
Ludwig Mendelson	Prussia (German Reich)
Antoine Dubreuil	New York
Irving J Moffett	Missouri
Harlan Eugene Karr	Vermont
William A. Brady	"
Walter D Berry	Massachusetts
Wm. Elmar MacDonald	"
Ludwig Hirsch Hoffman	Bavaria (German Reich)
Margaret Warren Barnes	Montana

The following have been registered by endorsement of credentials (National Board of Medical Examiners)

Leo Herbert Hadler
Harry B Luke
Paul Porter Gates
Ellsworth Morton Tracy
Sven M. Gundersen
Simon Stone
Byron Lewin
Daniel McCooey
Harry L. Day

STATE BOARD OF HEALTH

Dr Travis Burroughs, secretary of the State Board of Health, announces that serums for pneumonia due to Types I, II, V and VII are available to physicians who send sputums to the State Laboratory of Hygiene at the State House, Concord. Other laboratories will be approved for typing as rapidly as technicians can be trained. Dr Burroughs advises that the mails or express should not be used for sending sputums. Messengers can be given serum, when indicated, within a very short time after the sputum is received at the laboratory.

* * *

The new form of Certificates of Death and Birth have been sent by the State Board of Health to all physicians. Complete instructions for preparing the new certificates have been prepared, but the department will gladly aid individuals and hospitals in the explanation of the new records.

COMMITTEE ON CONTROL OF CANCER

The Committee recently sent to all physicians in New Hampshire a letter from which the following is an abstract

CANCER OF THE UTERUS

Too many women are being discovered at the diagnostic and treatment centers of this state with advanced cancer of the cervix or uterine fundus. There are two obvious remedies for this situation

- 1 Pelvic examination of all women above the age of 35 followed by remedial surgery where there are uterine growths, or lacerations, ulcerations or erosions of the cervix. This would probably reduce the incidence of cervical cancer by 50 per cent.
- 2 Educate all women—beginning with the younger generation—that flowing between periods or after the menopause always means there is a pathological cause. *Educate women to the idea that an increase in flowing at the menopause is not normal and that there is always a cause* (Unfortunately, some physicians do not recognize this truth.)

Educate women in the knowledge that the very smallest blood discharge (spotting) is a more serious indication than free flowing. You should tell all your women patients to come for examination upon the least sign of abnormal bleeding.

When symptoms are present that may indicate the presence of cancer of the uterus a definite diagnosis should be made at once by (1) a biopsy specimen taken from the proper place and in the proper manner, from any erosion or growth of the cervix or (2) if the cervix is normal, by a curettage and an examination of all the curetted material by a competent pathologist

The percentage of cures in cancer of the cervix when it is confined to the cervix alone is high, about 80 per cent, and these figures can be approached if the above rules are followed.

SOCIETY NEWS

At the regular meeting of the Dover Medical Society on January 5 Frank Sulloway, Esq., of Concord, gave an address on 'Medical Defense Methods in New Hampshire.'

* * *

The Carroll County Medical Society met at the home of the president, Dr Louise Paul, at Wakefield, on the evening of December 5. Dr Dawson Tyson, of Hanover, read a practical clinical paper on 'Treatment of Pulmonary Suppuration.' Dr James E. Bovaird was chosen president, and Dr Charles Smith secretary-treasurer for the coming year. Miss Caroline Paul, technician at the Mary Hitchcock Hospital, acted as hostess with her sister. Drs. W. J. Paul Dye and Francis J. C. Dube were elected delegates to the New Hampshire Medical Society.

* * *

At a meeting of the Belknap County Medical Society in January, Dr Howard M. Clute, of Boston, spoke on 'Gall Bladder Disease.' Dr Clute's talk was exceedingly interesting and instructive, and a lively discussion followed.

DEATH

Dr Mary S. Danforth, for many years a busy physician in Manchester and the first woman member of the New Hampshire Medical Society, which honored her a short time ago with the gold medal for fifty years membership, recently died at her home in Manchester. Dr Danforth

who was a pioneer in medicine, had had a most successful career

PERSONALS

Dr John Lyle, formerly physician at Camp Belknap, began an internship at the Mary Hitchcock Hospital on January 4

Dr Harold Loverud, of Manchester, has been made a consultant in roentgenology to the Margaret Pillsbury Hospital

Dr Harry B Luke, of Huntington, Long Island, has opened an office for the practice of general medicine at Wolfeboro

Dr Andrew Oberlander, formerly of Reading, Massachusetts, who has been elected university physician at New Hampshire University, began his service on January 1

Dr Leo H Hadler has opened an office at Goffstown

Dr R. A. Hernandez, of Laconia, is on a six weeks' vacation in Cuba

NOTES

The Plymouth Hospital Association is making plans for an entirely new modern hospital.

The Laconia Clinic in Laconia is being formed and plans to begin to function in the early part of February, when it is expected that the new building which is being erected will be completed. The personnel is as follows Dr Smart (surgery), Dr R. A. Hernandez (ear, eye, nose and throat), Drs Perley, La France and Brown (medicine), Dr Robinson (urology), and Dr Sullivan (dentistry)

This is our first attempt to have a New Hampshire news section in each of the New Hampshire issues of the *Journal*. If you approve of the idea, send us some news. Suggestions for improvement will be welcome.

CARLETON R. METCALF, *Secretary*,
5 South State Street, Concord.

VERMONT STATE MEDICAL SOCIETY

RECENT DEATH

ALLEN—TRUMAN ALLEN, M.D., of Brandon, Vermont, died at his home, December 29, after a long illness. He was in his fiftieth year.

A native of Royalton, he attended the Royalton schools and Montpelier Seminary, and received his degree from the University of Vermont College of Medicine in 1912. His internship was served at the Mary Fletcher Hospital, following which he became assistant physician at the Vermont State Hospital in Waterbury, Vermont. In 1918 he was made clinical instructor in psychiatry at the University of Vermont College of Medicine and became assistant professor of neurology ten years later.

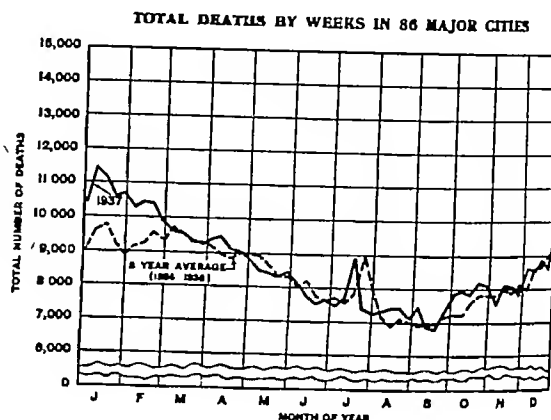
For nineteen years Dr Allen was superintendent of the Brandon State School and at the time of his death was neurologist at the Mary Fletcher Hospital in Burlington and neuropsychiatrist at the Rutland City Hospital. Dr Allen was a fellow of the American Medical Association and a member of the Vermont State Medical Society and the American Association on Mental Deficiency.

His widow, a son, a daughter, a brother and a sister survive him.

MISCELLANY

MORTALITY SUMMARY FOR 1937

Deaths in 86 major cities during 1937 dipped slightly under the 1936 figures, according to preliminary reports recently made by Director William L. Austin, Bureau of the Census, Department of Commerce. The infant death rate in these cities was also slightly lower last year, compared with 1936.



Deaths in the 86 cities in 1937 totaled 446,524 compared with 448,888 reported for 1936. The provisional infant mortality rate for the 86 cities is 47 per 1000 live births, compared with 50 per 1000 live births in 1936.

Although the number of deaths reported in 1937 was practically the same as that reported in 1936, several differences in the general mortality experience may be pointed out. In the last week of 1936 there was a sharp increase in mortality, largely due, presumably, to an increase in deaths from pneumonia and influenza. This excess mortality continued during the first two months of 1937, the number of deaths each week remaining above the average for the preceding three years.

Another notable feature in the 1937 mortality seasonal curve was a sharp increase in deaths due to the heat wave of last July. The heat wave at that time caused a considerable peak in the mortality curve, but there was a much greater effect during the excessive heat wave of July, 1936.

The 28,485 infant deaths reported for 1937 represent a decrease of 341, or 1.2 per cent, from the 28,826 reported for 1936. On the basis of estimated number of births there were, in 1937, 47 infant deaths for each 1000 births. Although this figure is provisional, it indicates a real decrease in infant mortality when compared with the comparable provisional rate of 50 for 1936 — *U S Department of Commerce*.

THE FOUNDATION PRIZE

Dr James R. Bloss, secretary of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, has received so many inquiries concerning the rules governing the award of the Foundation Prize by the association that they are herewith given in full:

(1) The award which shall be known as The Foundation Prize shall consist of \$500.

(2) Eligible contestants shall include only (a) in terns, residents and graduate students in obstetrics, gynecology or abdominal surgery and (b) physicians

(with an M.D. degree) who are actively practicing or teaching obstetrics, gynecology or abdominal surgery

(3) Manuscripts must be presented under a nom-de-plume, which shall in no way indicate the author's identity, to the Secretary of the Association together with a sealed envelope bearing the nom-de-plume and containing a card showing the name and address of the contestant.

(4) Manuscripts must be limited to 5000 words, and must be typewritten in double spacing on one side of the sheet. Ample margins should be provided. Illustrations should be limited to such as are required for a clear exposition of the thesis

(5) The successful thesis shall become the property of the Association, but this provision shall in no way interfere with publication of the communication in the journal of the author's choice. Unsuccessful contributions will be returned promptly to their authors

(6) All manuscripts entered in a given year must be in the hands of the Secretary (Jas R. Bloss, M.D., 418 Eleventh Street, Huntington, West Virginia) before June 1

(7) The award will be made at the annual meetings of the Association, at which time the successful contestant must appear in person to present his contribution as a part of the regular scientific program, in conformity with the rules of the Association. The successful contestant must meet all expenses incident to this presentation.

(8) The President of the Association shall annually appoint a Committee on Award, which, under its own regulation, shall determine the successful contestant and shall inform the Secretary of his name and address at least two weeks before the annual meeting

CORRESPONDENCE

TEACHING OF OBSTETRICS

To the Editor My 'Note on the Teaching of Obstetrics,' which appeared in the November 4 issue of the *Journal*, has received so much unfavorable comment that perhaps a word of explanation is appropriate. It is not worth while to give all the criticism in detail, but two chief points may be noted. 'If the answer is easy, tell us, for we should like to know it,' and 'It is not possible to give an answer that all obstetricians will agree on as the way they would treat such a case. One critic claimed that the right answer to the question is, Nothing

It seems to me that there is a widespread misunderstanding on the question and its purpose. Of course there are unformulated hypotheses in the background and some of them are you are a physician and you have accepted the responsibility of giving your patient at her confinement the best care you can, up until labor is completed, labor has progressed normally until twenty minutes after the birth of the child, the placenta has not been delivered and there are no signs of separation of the placenta, give in detail the treatment you would employ up until the delivery of the placenta is completed.

It is a not unfair assumption that the physician does not leave the patient to take care of herself at the end of the twenty minutes, with a feeling of complete discharge of his responsibility, which is what the "nothing" implies. It would be a good thing for some obstetricians to

learn that they are not doing nothing for their patients when they refrain from operating on them. Perhaps the question may be criticized as not being explicit enough about the background, but a number of the candidates seemed to understand and wrote very creditable answers. Of these I said nothing in the note.

The purpose of the question was, first, to set a problem. Thus I think it did for nearly all, if not all, of the candidates. Not so, however, for the teacher of obstetrics whose answer is "nothing." For him there was no problem, yet he wants to know the easy and correct answer. Secondly, the question sought a solution for the problem. The solution may be sought along two lines—procedure or method, and information. The question is worded 'Give in detail' which may fairly include 'What would you do? How would you do it? When would you do it? Why would you do it?' There is a 'correct' answer which did not satisfy the examiner, yet I would call a 'con-sultant' is practically the part of wisdom for some physicians. Perhaps this corresponds to the 'nothing' to which reference has already been made.

There exists in the minds of some critics a confusion between the written answer and the answer in practice. The written answer proceeds with comparative ease because step after step, from the least to the greatest, is taken when, in the judgment of the physician, it should be taken. The difficulty in practice may be of comparatively great magnitude in finding out exactly when something else should be done, and just what this should be, that is, in making up one's mind and reaching a just judgment as to the next step. It is conceivable that in practice the physician may wisely pass in a comparatively short time from palpation of the fundus, in order to see if there is a second child in the uterine cavity, to hysterectomy. There would be reasons for this which the written answer should at least suggest.

It may be impossible to secure unanimity in the practical answer. One physician may say, 'In my opinion, now is the time to interfere. I don't like her looks. Another may say, 'I think we ought to wait another hour.' To the lack of thoroughness in the replies reference has already been made, but there is another point which the examination brought out to which I did not refer in the note. Comparatively few of the candidates exhibited any logical method of procedure. Yet after all, is not the teaching of correct method at least as valuable as the imparting of correct information as to facts?

STEPHEN RUSHMORE, M.D.

520 Commonwealth Avenue,
Boston

FICTION OR PROPAGANDA?

To the Editor The able editorial writer in the *Journal of the American Medical Association* has already dealt with Doctor Cronin's novel *The Citadel*, but I, nevertheless, feel that what appears to me to be the most important part of the book has been overlooked.

I found little in the novel to commend it as such. The story is thin though readable, the difficulties and discouragements of dispensary practice have been better and more poignantly described by Maygban and others, the failings of some members of the medical profession have been exposed thoroughly, if not charitably, by one of our writers of modern journalism, and many times before, appealing characters have literally been bumped off by motor vehicles for the purpose of adding needed tragic interest to the tale.

There is, of course, a segment of the public that seems

never to tire of literary smirching. Furthermore, when a book, for one reason or another, reaches the commercial heights of the best seller class, it virtually becomes a "must" item in every novel reader's agenda. And now *The Citadel* is to appear on the motion picture screen.

As I read Doctor Cronin's book my interest flagged until I came upon the name, Spahlinger. I wondered at the author's choice of Spahlinger as his prototype of ill treated geniuses and when I encountered the same name farther on in the text, my wonder increased. Then, when I read of the miraculous manner in which a nonmedical man salvaged a wreck of the hero's own malpractice, I could see in the novel only a brief for the supposedly abused man of science.

The miracle worker in the story came from the north western portion of the United States. Without benefit of medical education he had devised a system for the treatment of respiratory infections that worked wonders where England's best physicians had failed. His reward was persecution—a persecution which, for a time, also threatened the career of the hero. But, in true cinema fashion, sentiment, or sentimentality, prevailed, the hero was cleared of the outrageous charges, abandoned his questionable practices and returned to the fold to which all good and upright doctors belong.

There then came to mind the great to-do over the Duke Fingard method of treatment of diseases of the respiratory tract. Again the scene is England and the central figure is a nonmedical man—a chemist from the American North west who, with a battery of germicides and whatnot, alleges to cure his patients by a course of inhalations. The medical profession, despite the allegiance to the scheme of some members of the aristocracy and some gentlemen with many letters after their names, have been equally disdainful of the American chemist and his mode of therapy.

Spahlinger, Doctor Cronin's chemist martyr—Duke Fingard! To me the parallels are too close to be taken as mere coincidence.

BENJAMIN WHITE, M.D.

646 Park Avenue,
New York City

RECENT DEATHS

PARIS—WILLIAM PARIS, M.D., of 139 Washington Avenue, Chelsea, died recently. He was in his thirty-eighth year.

Dr. Paris received his degree from Tufts College Medical School in 1926. He was a fellow of the Massachusetts Medical Society and the American Medical Association.

MANIX—EDWARD T. MANIX, M.D., of 59 Lewis Street, Lynn, died January 20 after a short illness. He was in his fifty third year.

A native of Exeter, New Hampshire, he attended Exeter Academy and received his degree from Harvard Medical School in 1898.

Dr. Manix was a fellow of the Massachusetts Medical Society and of the American Medical Association. He was a member of the Oxford Club, of Lynn, and the Tedesco Golf Club, of Marblehead.

Two sisters in Exeter, New Hampshire, survive him.

REPORTS OF MEETINGS

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

A meeting of the Middlesex South District Medical Society was held at the Cambridge Hospital on Wednes-

day morning, January 19. About 200 members were in attendance. Dr. Fred R. Jouett, president, presided.

Dr. Frederic A. Washburn, director of the hospital, was introduced and made a short speech of welcome. He stated that the Cambridge Hospital had developed a much improved pathological and bacteriological laboratory, that it was co-operating with the Massachusetts Department of Public Health in its campaign against venereal diseases, that the hospital was a station for premature babies, and that pneumonia typing was being done there. He further stated that he hoped that the institution would become a truly community hospital.

The program consisted of a clinicopathological discussion of cases, as follows:

- 1 A Case of Hemophilia with Necrotizing Prostatitis and Terminal Septicemia. Drs. Bryant Wetherell and Arthur H. Crosbie.
- 2 A Case of Spontaneous Fracture of Femur Due to Metastatic Carcinoma. Dr. James W. Sever.
- 3 A Case of Chronic Glomerulonephritis. Dr. James H. Townsend.
- 4 A Case of Post transfusion Anuria. Dr. Donald E. Currier.
- 5 Two Cases of Arteriosclerotic Heart Disease. Drs. David C. Dow, Jr. and James H. Townsend.
- 6 A Case of Uterine Fibroids and Pregnancy. Dr. Henry T. Hutchins.
- 7 A Case of Gallstones with Death from Liver Shock. Drs. Hollis L. Seavey and Horace P. Stevens.
- 8 A Case of Severe Anemia with Enlarged Liver and Spleen. Drs. Newton S. Bacon and Stephen M. Biddle.
- 9 A Case of Bacillus-X Endocarditis. Dr. Lendon Snedeker.

The pathological and postmortem findings in all cases were discussed by Dr. Harold E. MacMahon.

At the termination of the meeting, Dr. Jouett announced that the postgraduate course in instruction will begin in March and will be given at the Cambridge City Hospital, without charge. The full program is to be announced at a later date in the *New England Journal of Medicine*.

A buffet luncheon was served after the meeting.

ALEXANDER A. LEVI, M.D., Secretary

GREATER LAWRENCE MEDICAL ASSOCIATION

The annual meeting of the Greater Lawrence Medical Association was held on Thursday evening, January 20, in the staff library of the Lawrence General Hospital.

The guest speaker was Dr. Chester S. Keefer, associate physician, Thorndike Memorial Laboratory, Boston City Hospital, and associate professor of medicine, Harvard Medical School. His subject was "What Can Be Done for the Patient with Arthritis?" Dr. Keefer delivered a splendid lecture on the various forms of arthritis and described old and new forms of treatment.

A fee table was adopted for the doctors practicing in Greater Lawrence, which comprises Lawrence, Andover, Methuen and North Andover. The fees were not raised, but merely brought up-to-date for the convenience of medical men of this community. This is the first fee table to be adopted in thirty years.

A committee of three was appointed to study the matter of sponsoring a series of weekly medical broadcasts over a local station.

Officers for the ensuing year were elected as follows: president, Dr. Nicandro F. DeCesare, vice president, Dr.

Edward H. Ganley, secretary, Dr J LeRoy Wood, treasurer, Dr John T Batal, directors Drs. Henry F Dearborn, Victor A Reed, Harold R. Kurth, Carl H. Eidam and Nicholas J Scarito

NOTICES

REMOVAL

RICHARD H. OVERHOLT, M.D., announces the removal of his office to 1101 Beacon Street, Brookline.

JOSEPH D. WHELAN, M.D., announces the removal of his office to 482 Beacon Street, Boston.

LAWRENCE CANCER CLINIC

The regular Lawrence Cancer Clinic, to be held at the Lawrence General Hospital, 1 Garden Street, Lawrence, on Tuesday, February 1, at 10 00 a. m., will be a demonstration and teaching clinic for physicians, with Dr Channing C. Simmons present as consultant. Physicians of the north half of Essex County are invited to accompany any of their patients whom they desire to have this service or to send them with a note. A report will be returned to every physician who sends a patient. The service is gratis. Any physician is welcome to attend the clinic.

This clinic is endorsed by the Committee on Postgraduate Instruction of the Massachusetts Medical Society

ROY V. BAKETEL, M.D.,
CHARLES J. BURGESS, M.D.,
JOHN J. MCARDLE, M.D.,
HARRY H. NEVERS, M.D.,
THOMAS V. UNIAC, M.D.,
J. FORREST BURNHAM, M.D., *Chairman*

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen, discussed, and when indicated, treated with radium and high voltage x-ray.

Physicians are welcome to visit this clinic and to bring a patient to the clinic for diagnosis.

BOSTON CITY HOSPITAL

A symposium on hepatic and biliary diseases will be held on Saturday, February 5, at 10 30 a. m. in the Thorndike Amphitheater. The papers to be presented are as follows:

1. Normal and Morbid Physiology of the Liver. Dr Stephen J. Maddock.
2. Pathology of Jaundice and Its Relations to Hepatic and Biliary Disease. Dr G. Kenneth Mallory.
3. Medical Aspects of Diseases of the Liver. Dr Chester S. Keefer.
4. Surgery of the Gall Bladder and Bile Ducts. Dr Irving J. Walker.

ROBERT M. GREEN, M.D., *Chairman*
COMMITTEE ON HOSPITAL CLINICS.

RADIO BROADCASTS

The fifth group of weekly broadcasts sponsored by the American Medical Association and the National Broadcasting Company concern preventing future illness. These dramatized health messages are intended to furnish supplementary material for health teaching in junior and

senior high schools and are broadcast every Wednesday from 2 00 to 2 30 p. m. over the Red Network. The dates and subjects are as follows:

February 2—Rheumatism and Arthritis. Known factors in the causation of arthritis and its care.

February 9—Healthy Hearts and Arteries. Known ways of protecting the heart against infection and hygienic abuse, how to live with heart disease.

February 16—Don't Fear Cancer—Fight It. Known factors in the cause, prevention and treatment of cancer.

February 23—Overcoming Diabetes. Individual efforts plus medical aid will win against diabetes.

WACHUSETT MEDICAL IMPROVEMENT SOCIETY

There will be a meeting of the Wachusett Medical Improvement Society at the Hotel Bancroft, Worcester, Wednesday evening, February 2, at 7 30. A dinner will be served at 6 30.

Dr J. Dellinger Barney will speak on 'The Problem of Urinary Lithiasis.'

WALTER D. BIEBERBACH, M.D., *President*,
N. S. SCARCELLO, M.D., *Secretary*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, February 8, at 8 15 p. m.

PROGRAM

Presentation of Cases.

The Aging of Some Homeostatic Mechanisms. Dr Walter B. Cannon.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary*

CARNEY HOSPITAL

The monthly meeting of the Outpatient Department of the Carney Hospital will be held on Tuesday, February 1. Dr Benjamin Roseman will speak on "Membrana Tympani."

WILLIAM J. MACDONALD, M.D., *Secretary*

GREATER BOSTON MEDICAL SOCIETY

There will be a meeting of the Greater Boston Medical Society in the Beth Israel Hospital Auditorium on Tuesday, February 1, at 8 30 p. m.

Dr Charles Geschickter will speak on "Diagnosis and Treatment of Neoplasms of the Breast." Discussion by Drs. Charles Mixter, Reuben Davidoff and Harry F. Friedman.

K. C. ROSEN, M.D., *President*
D. B. STEARNS, M.D., *Secretary*

FAULKNER HOSPITAL

The usual clinicopathological conference will be held at the Faulkner Hospital for its staff and any other interested members of the medical profession on Thursday, February 3.

There will be a discussion of cases by Dr Franklin G. Balch, Jr., and Dr David L. Halbersleben.

never to ture of literary smirching Furthermore, when a book, for one reason or another, reaches the commercial heights of the best seller class, it virtually becomes a "must" item in every novel reader's agenda. And now *The Citadel* is to appear on the motion picture screen.

As I read Doctor Cronin's book my interest flagged until I came upon the name, Spahlinger I wondered at the author's choice of Spahlinger as his prototype of ill treated geniuses and when I encountered the same name farther on in the text, my wonder increased. Then, when I read of the miraculous manner in which a nonmedical man salvaged a wreck of the hero's own malpractice, I could see in the novel only a brief for the supposedly abused man of science.

The miracle worker in the story came from the north western portion of the United States. Without benefit of medical education he had devised a system for the treatment of respiratory infections that worked wonders where England's best physicians had failed His reward was persecution—a persecution which, for a time, also threatened the career of the hero But, in true cinema fashion, sentiment, or sentimentality, prevailed, the hero was cleared of the outrageous charges, abandoned his questionable practices and returned to the fold to which all good and upright doctors belong

There then came to mind the great to-do over the Duke-Fingard method of treatment of diseases of the respiratory tract. Again the scene is England and the central figure is a nonmedical man—a chemist from the American North west who, with a battery of germicides and whatnot, alleges to cure his patients by a course of inhalations The medical profession, despite the allegiance to the scheme of some members of the aristocracy and some gentlemen with many letters after their names, have been equally disdainful of the American chemist and his mode of therapy

Spahlinger, Doctor Cronin's chemist martyr—Duke Fingard! To me the parallels are too close to be taken as mere coincidence.

BENJAMIN WHITE, M.D

646 Park Avenue,
New York City

RECENT DEATHS

PARIS—WILLIAM PARIS, M.D., of 139 Washington Avenue, Chelsea, died recently He was in his thirty-eighth year

Dr Paris received his degree from Tufts College Medical School in 1926 He was a fellow of the Massachusetts Medical Society and the American Medical Association

MANIX—EDWARD T MANIX, M.D., of 59 Lewis Street, Lynn, died January 20 after a short illness. He was in his fifty third year

A native of Exeter, New Hampshire, he attended Exeter Academy and received his degree from Harvard Medical School in 1898

Dr Manix was a fellow of the Massachusetts Medical Society and of the American Medical Association. He was a member of the Oxford Club, of Lynn, and the Tedesco Golf Club, of Marblehead.

Two sisters in Exeter, New Hampshire, survive him

REPORTS OF MEETINGS

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

A meeting of the Middlesex South District Medical Society was held at the Cambridge Hospital on Wednes-

day morning, January 19 About 200 members were in attendance. Dr Fred R. Jouett, president, presided.

Dr Frederic A. Washburn, director of the hospital, was introduced and made a short speech of welcome. He stated that the Cambridge Hospital had developed a much improved pathological and bacteriological laboratory, that it was co-operating with the Massachusetts Department of Public Health in its campaign against venereal diseases, that the hospital was a station for premature babies, and that pneumonia typing was being done there. He further stated that he hoped that the institution would become a truly community hospital

The program consisted of a clinicopathological discussion of cases, as follows

- 1 A Case of Hemophilia with Necrotizing Prostatitis and Terminal Septicemia. Drs Bryant Wetherell and Arthur H. Crosbie.
- 2 A Case of Spontaneous Fracture of Femur Due to Metastatic Carcinoma Dr James W Sever
- 3 A Case of Chronic Glomerulonephritis. Dr James H. Townsend
- 4 A Case of Post transfusion Anuria. Dr Donald E. Currier
- 5 Two Cases of Arteriosclerotic Heart Disease. Drs. David C. Dow, Jr and James H. Townsend.
- 6 A Case of Uterine Fibroids and Pregnancy Dr Henry T. Hutchins
- 7 A Case of Gallstones with Death from Liver Shock. Drs. Hollis L. Seavey and Horace P. Stevens.
- 8 A Case of Severe Anemia with Enlarged Liver and Spleen. Drs. Newton S. Bacon and Stephen M. Biddle.
- 9 A Case of Bacillus-X Endocarditis. Dr Lendon Sneedker

The pathological and postmortem findings in all cases were discussed by Dr Harold E. MacMahon.

At the termination of the meeting, Dr Jouett announced that the postgraduate course in instruction will begin in March and will be given at the Cambridge City Hospital, without charge. The full program is to be announced at a later date in the *New England Journal of Medicine*

A buffet luncheon was served after the meeting

ALEXANDER A. LEVI, M.D., Secretary

GREATER LAWRENCE MEDICAL ASSOCIATION

The annual meeting of the Greater Lawrence Medical Association was held on Thursday evening, January 20, in the staff library of the Lawrence General Hospital.

The guest speaker was Dr Chester S. Keefer, associate physician, Thorndike Memorial Laboratory, Boston City Hospital, and associate professor of medicine, Harvard Medical School. His subject was "What Can Be Done for the Patient with Arthritis?" Dr Keefer delivered a splendid lecture on the various forms of arthritis and described old and new forms of treatment.

A fee table was adopted for the doctors practicing in Greater Lawrence, which comprises Lawrence, Andover, Methuen and North Andover. The fees were not raised, but merely brought up-to-date for the convenience of medical men of this community. This is the first fee table to be adopted in thirty years.

A committee of three was appointed to study the matter of sponsoring a series of weekly medical broadcasts over a local station.

Officers for the ensuing year were elected as follows: president, Dr Nicandro F. DeCesare, vice president, Dr

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A USEFUL TYPE OF LIGHT, WATERPROOF CAST

Preliminary Report

AUGUSTUS THORNDIKE, JR., M.D.,* AND WALTER E. GARREY, M.D.†

BOSTON

THE story of the use of splinting materials from the earliest records of the Egyptians three thousand years ago down to the present era of the plaster-of-Paris bandage is a fascinating one. This paper, however, can give only the high lights. It is of particular interest to find that the Egyptians used a combination of beeswax and rosin.¹ The natives of India, it is recorded, secured excellent results with clay molds.² Hippocrates was apparently familiar with rosin and wax.³ The European surgeons of the eighteenth and early nineteenth centuries preferred splints made from cloth saturated with albumen.⁴

The first attempt to devise lighter and less bulky splints was made about 1834, when Seutin quoted by Gamgee⁵ began using starched bandages. Monro⁶ credits Cheselden, Larrey and Dieffenbach with achieving the first adaptable use of plaster of Paris by making molds of a correctly reduced fractured limb in a wooden box. Matthysen⁷ was the first to think of impregnating coarsely meshed cotton cloth with powdered plaster, about 1852. At first this form of splint competed strenuously with starched bandage, then with dextrin, gutta percha and sodium silicate; it gradually won over all competitors through the manufacture of better cotton material or cotton cloth. Certain alterations and additions of a chemical nature—for example, salt and acetic acid—have produced changes in the setting time of the plaster, but generally speaking little if any change has taken place in the character of plaster-of-Paris bandage during the last twenty years.

Industrial chemistry has in recent years been producing in ever-increasing volume new and most interesting synthetic resins or "plastics." The opportunity to test the value of such materials for forming a rigid bandage or cast first presented

itself to the authors in February, 1937. Dextrin and gelatin bandages have been used extensively to form semirigid bandages. Celluloid and pyroxylin products have been used both to make casts and to waterproof plaster. But these mediums have been generally abandoned because of their inflammable or explosive character. Certain instances are on record of fire's occurring in a celluloid-coated cast, ignited by static electricity. Shellac has been used to coat plaster, but takes days to dry. Cellulose-compound casts were made about five years ago by Dr. Peirce H. Leavitt,⁸ of Brockton, but the material at that time had the disadvantage of being too coarse and too inflammable. It is of interest that our attention was attracted to synthetic resins, and that we have returned to a material somewhat like that which the Egyptians used over three thousand years ago.

Our interest in developing a light, waterproof rigid cast was aroused through the following case. The patient, a young man, had suffered a comminuted Colles's fracture with a fractured cuneiform. He was a fancy diver on the Harvard diving team, and was extremely anxious to continue his training during immobilization. It was thus necessary to construct a waterproof cast which would immobilize his wrist and be strong enough to withstand the stress of diving.

We followed Leavitt's original suggestion, and found that the makers of cellulose products had developed a very hard, light, waterproof material for making box toes for shoes. The important discovery had recently been made that adding boric acid to the cellulose compound rendered it but little more inflammable, *when dry*, than wood. The hard box toes were produced by molding a fabric impregnated with this compound while it was moistened with a solvent. Using this somewhat crude material, a very satisfactory cast was constructed for our patient, and was worn daily in the water for five weeks.

It then became of interest to see whether this

*From the Department of Hygiene, Harvard University.

Read at a meeting of the Boston Orthopaedic Club, January 10, 1938.

†Surgeon, Department of Hygiene, Harvard University; Associate Surgeon, Children's Hospital.

Assistant Surgeon, Department of Hygiene, Harvard University.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JANUARY 31

TUESDAY FEBRUARY 1

- *10 a m 12 30 p m Tumor clinic Boston Dispensary
- 8 30 p m Greater Boston Medical Society Auditorium Beth Israel Hospital Boston.

WEDNESDAY FEBRUARY 2

- *12 m Clinicopathological conference Children's Hospital Amphitheater

THURSDAY FEBRUARY 3

- 8 30-9 30 a m Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Children's Hospital
- 5 p m Faulkner Hospital clinicopathological conference

FRIDAY FEBRUARY 4

- *10 a m 12 30 p m Tumor clinic Boston Dispensary
- 12 m Clinical meeting of the Children's Medical Service Massachusetts General Hospital Ether Dome

SATURDAY FEBRUARY 5

- *10 a m. 12 m Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A. Christian.
- 10 30 a m Boston City Hospital symposium on hepatic and biliary diseases Thorndike amphitheater

SUNDAY FEBRUARY 6

- 4 p m Illustrated public health lecture Faulkner Hospital auditorium Practical Hints for the Expectant Mother (women only) Dr D J Bristol Jr
- 4 p m Free public lecture. Harvard Medical School amphitheater of Building D Colds Influenza and Pneumonia Dr Maxwell Finland.
- 4 p m Free public lecture Beth Israel Hospital Boston in conjunction with the Women's Auxiliary Mental Health Dr Harry C. Solomon

*Open to the medical profession

JANUARY 27—Massachusetts Public Health Association Page 140 issue of January 20

FEBRUARY 1—Lawrence Cancer Clinic Page 203

FEBRUARY 1—Carney Hospital Page 203

FEBRUARY 1—Greater Boston Medical Society Page 203

FEBRUARY 2—Second National Social Hygiene Day Page 49 issue of January 6 and page 140 issue of January 20

FEBRUARY 2—Wachusett Medical Improvement Society Page 203

FEBRUARY 3—Faulkner Hospital Clinicopathological conference Page 203

FEBRUARY 5—Boston City Hospital symposium on hepatic and biliary diseases Page 203

FEBRUARY 8—Harvard Medical Society Page 203

FEBRUARY 10—Pentucket Association of Physicians Hotel Bartlett 95 Main Street Haverhill 8 30 p m.

FEBRUARY 14—American Board of Internal Medicine Page 969 issue of December 9

FEBRUARY 21—Boston Medical History Club 8 15 p m Boston Medical Library 8 Fenway

MARCH 10 11 12—New England Hospital Association Page 51 issue of January 6

APRIL 4 8—The American College of Physicians Page 41 Issue of July 1

MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

JUNE 13-17—American Medical Association San Francisco

OCTOBER 17 21—Clinical Congress of the American College of Surgeons New York City

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p m. New Bedford

ESSEX SOUTH

FEBRUARY 2—Council Meeting Boston

FEBRUARY 9—Essex Sanatorium Middleton Clinic at 5 p m Dinner at 7 p m Speaker Dr John B. Hawes 2d Subject. Dust and Disease

MARCH 2—Lynn Hospital Clinic at 5 p m Dinner at 7 p m Speaker and subject to be announced

APRIL 6—Gloucester Hospital Gloucester Clinic at 5 p m Dinner at 7 p m Speaker and subject to be announced.

MAY 5—Censors meet at Salem Hospital 3:30 p m

MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p m Speaker and subject to be announced

FRANKLIN

Meetings will be held at the Franklin County Hospital Greenfield at 11 a m the second Tuesdays of March and May

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club Stoneham at 12 15 p m on March 16 and May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 21

NORFOLK DISTRICT

FEBRUARY 23—Hotel Kenmore. 8 15 p m. Dermatitis Venenarum Due to Cosmetics and Industrial Irritants. Dr John G. Downing Duxbury by Dr Francis P. McCarthy

MARCH 29—Hotel Kenmore. 8 15 p m. Subject to be announced but to be related to diseases of the kidney Dr Albert A. Horner

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon

FEBRUARY 3—Norfolk County Hospital South Braintree.

MARCH 3—Norfolk County Hospital South Braintree

APRIL 7—At the Quincy City Hospital

MAY 5—Annual meeting

PLYMOUTH

Meetings will be held at 11 a m on March 17 April 21 May 19 and July 21

SUFFOLK

MARCH 15—Joint meeting with Boston Obstetrical Society

WORCESTER

At the following meetings except the annual meeting dinner will be at 6 15 to be followed by business session and scientific program

FEBRUARY 9—Worcester State Hospital, Worcester

MARCH 9—Memorial Hospital Worcester

APRIL 13—Hahnemann Hospital Worcester

MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced

BOOK REVIEW

The Biology of Human Conflict. An anatomy of behavior—individual and social Triggant Burrow 435 pp. New York The Macmillan Company, 1937 \$3.50

This is an irritating book. Behind a barrage of neologisms, and a verbose and involved style, one feels there lies considerable gold. But the recovery of this gold involves much labor. A glossary of twelve pages tries to explain the meaning of some of the author's terms. At times, one is strongly sympathetic with others who have induced the author to write "When in reply, therefore, to the critic who complains that he cannot understand my work I say that I cannot either, I am not in the least at tempting to be facetious. The statement is perfectly true." The following sentence is a sample of the complex style and terminology "With the innovation of the organisms symbolic system of reactions and its concomitantly wider range of adaptation, apparently there came about the adoption of sectors of contact and communication with the outer world in which the radii of attention and interest are tangential to the organism's total bionomic axis of rapport."

The book contains an introduction and fourteen chapters divided into three parts "Organismic Psychology," "Organismic Morphology," "Organismic Pathology or Phylopathology."

The reviewer hesitates to take issue with what he has difficulty in understanding, namely, the author's thesis and the elaboration thereof. He doubts, however, whether the wars of the world, the problems of criminology and the problems of psychiatry can be properly studied on a basis of functional conflict without constantly considering the elements of mental defect and deterioration.



Figure 5 Model of cylindrical cast in which wire has been inserted for 'banjo' traction

lighter than plaster, extremely hard, waterproof, and pervious to x-ray. A much smaller quantity is required to provide rigidity than is the case with plaster of Paris. The cast does not, however, harden so quickly, taking on the average thirty to forty minutes to harden sufficiently for the pa-



Figure 6 X-ray taken through model shown in Figure 5 and a similar model made of plaster of Paris. Both models were exposed on the same film at the same time. Note the difference in permeability to x-ray.

tient to be dismissed, and a longer time before it cannot be indented.

We have used this material to make numerous casts, it was convenient to handle and was well liked by the patients. Its lightness and waterproof character are its salient advantages. On account of its lightness it has been used to make numerous casts for the upper extremities, both molded and circular, for fractures of the carpal bones, Colles's fracture and fractures of both bones of the forearm, and to make three shoulder spicas for



Figure 7 Fracture of the surgical neck of the humerus in a child six years of age after reduction, put up in a shoulder spica of cellulose-compound bandage.

fractured humeri. It has been particularly comfortable when applied to the figure-of-eight retainer in cases with fractured clavicles. Where waterproofness is desired, it has been found most satisfactory for double leg spicas in children. We have employed it on a number of toe-to-groin cylinders and leg boots and in conjunction with Bohler walking irons. One of us (A. T.) has had 4 patients swimming daily while wearing these casts. In arthritic patients they have been found most applicable. The light weight enables the patient to turn comfortably in bed, and the cast can be worn in the whirlpool and Hubbard baths. Our associate, Dr. R. J. Joplin, has used this material to



Figure 1 Bilateral fractures of the carpal scaphoids in a young man, twenty-one years of age Cellulose-compound 'cock up' casts

material could be supplied in a form in which it could be rolled on as readily as a wet plaster-of-Paris bandage, and be used for other types of casts. Numerous trials were carried out by impregnating various fabrics with the compound, that is, flannel strips, woven bandage, crinoline,



Figure 2. X-ray of case shown in Figure 1 taken through the casts

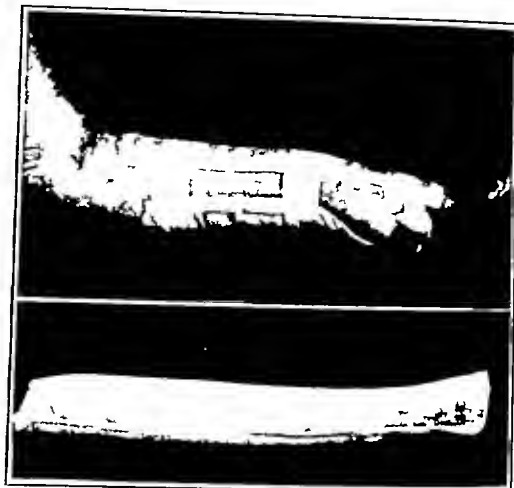


Figure 3 Fracture of both bones of the forearm just above the wrist in a child, seven years of age showing splints molded from cellulose-compound bandage

felts with scaved edges and cotton cloth. The present most acceptable product is rolled, untied, unbleached cotton sheeting, cut on the bias in 2- and 3-inch widths and supplied in 10 yard lengths. These bandages, correctly moistened with the quick-drying solvent, are supplied in hermetically sealed cans.

The casts made from this material are far



Figure 4 Fracture of both bones of the forearm in a child six years of age, showing cylindrical cast of cellulose-compound bandage

the skin, or by using stockinet. Sheet wadding may be used, although drying is not quite so rapid, on account of the slower evaporation of the solvent from the inside layer. The main factor required in drying is ventilation, and unless the



Figure 11 X-ray taken through the cellulose-compound bandage shown in Figure 10

material used for padding permits the access of air to the inside layer, the setting time is unduly prolonged. Cotton wadding may be substituted for the bandage or stockinet after the cast has been split or the molded splints have been removed for the first time. The danger of applying the cast too tightly and not allowing for shrinkage should be emphasized, this danger has been

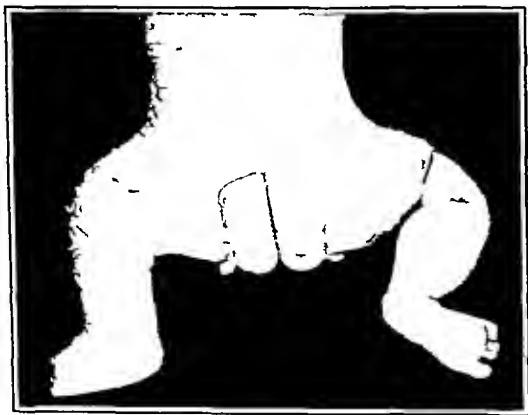


Figure 12. Small infant with congenital hip put up after reduction in a cellulose-compound hip spica

minimized by providing an impregnated cloth cut on the bias. Owing to the rapid evaporation of the solvent it is advisable to open but one bandage at a time. Lamination may be prevented by painting the cast with some of the cellulose acetate lacquer (supplied in separate cans) the day after its application.

To acquire the technic of applying this type of cast takes practice and experience. One could

scarcely expect the first application to be any more perfect than that of plaster-of-Paris bandage.

The method of removal differs slightly from that used with plaster-of-Paris bandage. Cutting, bivalving or complete removal may be accomplished with the ordinary commercial type of plaster-cutter (Stille or Zimmer), or with a sharp knife having the arc of the usual surgeon's knife. A pointed plaster knife is unsatisfactory. When the cast is cut with a keen tool, a strip of thin, pliable metal, a throat stick, or a similar object should be inserted between the cast and the skin so as to



Figure 13 Fracture of both bones of the leg, middle third in a child five years of age, put up in cast of cellulose-compound bandage

avoid cutting the patient. A one-quarter inch strip of felt, applied when the cast is put on and lying along the site at which it will later be cut, will give similar protection. Owing to inherent factors in the hardened cellulose type of cylindrical cast, notably its resiliency in the horizontal plane or the plane in which the bandage is wound on, it is seldom necessary to cut the cast on more than one side for removal.

In reporting on a new type of rigid bandage, it is only fair to emphasize its disadvantages as well as its merits. Many patients object to the sickening odor of acetone present when the bandage is still moist. This odor disappears as drying or hardening takes place, adequate ventilation will mini-

construct jackets for painful arthritic spines (lightness being the advantage), to splint osteomyelitis cases, and to wedge deformed knees. We have utilized it for numerous protective devices for athletic injuries where lightness, great strength and waterproofing were in demand. Stitching may be done through the bandage with leather-working tools. Knee braces, shoulder and chest protectors and Thomas collars have been made. One forearm cast protecting a fractured carpal scaphoid was worn through two football games in heavy rain.



Figure 8 Shoulder spica for a refracture through the middle third of the left humeral shaft after operative reduction in a man sixty-two years of age

The method of application of the bandage, which is applied in either cylindrical-cast or molded-splint form, is similar to that adopted with plaster-of-Paris bandage, except that only three thicknesses are required, in certain areas of long or bulky casts, however, additional reinforcing slabs or circular layers may be required to counteract stresses or strains. This product has one outstanding advantage: should the cast crack at any point it is not destroyed, but can be mended with additional lacquer (solvent) and bandage. The mended bandage is as strong as the original, or even stronger. The incorporation of wire or steel (banjo wire or Bohler iron) results in a stronger bond between the parts than that when plaster of Paris is used. As stated, the bandage is packaged with the proper

amount of solvent so that it cannot dry. There is no dripping when the cast is applied, the whole process being a singularly clean one. The surgeon's hands may be protected from the collodion-like film by rubber gloves, the film readily flakes off later in any case.

In applying the casts, drying will be facilitated by laying three thicknesses of gauze bandage over



Figure 9 X-ray of case shown in Figure 8, taken through the spica and clearly showing bone repair and callus

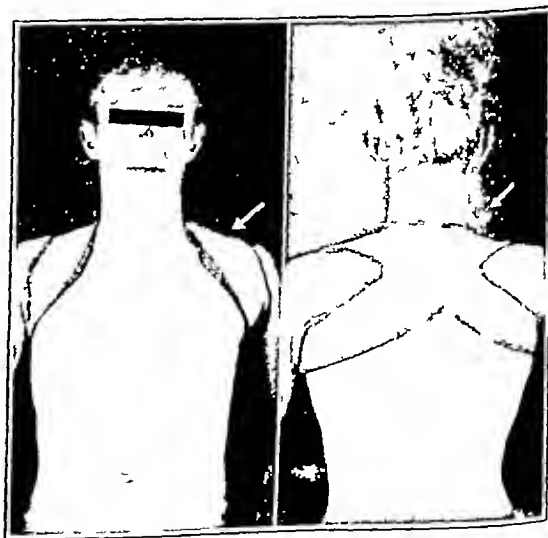


Figure 10 Fracture of the left clavicle in a young man, twenty-one years of age, put up in a figure-of-eight retainer made of cellulose-compound bandage

extremely hard, and pervious to x-ray. Four possible objections to it have been cited, in every instance they are found to be of relatively slight importance, none precluding the use of this type of cast in conditions requiring a fixative bandage.

We are indebted to the industrial chemists Stanley Lovell and Gardener Pratt and to the research laboratory of the Arden Rayshine Company for their co-operation.

319 Longwood Avenue.

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THE SURGICAL TREATMENT OF ABDOMINAL FISTULAS

SAMUEL F. MARSHALL, M.D.,* AND FRANK H. LAHEY, M.D.†

BOSTON

ABDOMINAL fistulas are uncommon complications of abdominal conditions, but still occur frequently enough to merit a consideration of their cause, origin and method of treatment. They may originate in any part of the gastrointestinal tract, from the biliary system, from the pancreas or from the genitourinary tract. We present a study of fistulas arising from the small and large intestine, together with reports of illustrative cases, including a case of pancreatic fistula in which the patient was successfully operated on by one of us (F. H. L.). We have purposely omitted from this group of cases all biliary, urinary and duodenal fistulas, since we believe that a report of these cases should comprise a separate study.

During the past ten years at the Lahey Clinic we have examined, and advised operation on, 37 patients with fistulas arising from the intestinal tract (Table 1). Of these, 27 were submitted to operation. During this period were seen many other cases of fistula in which operation was thought inadvisable or unnecessary. During the past year (1936) we have examined and operated on 6 patients, with a complete eradication of the fistula in all cases.

This group included a wide variety of ages, the youngest patient was two years old and the oldest seventy-six. Twenty-three patients ranged from thirty to sixty. Twenty-two were men and 15 were women.

Fecal fistula commonly results from sloughing of the bowel wall from severe infection, it may also be caused by injury to the adjacent loops of the bowel during an operative procedure. Severe trauma to the abdomen may be the primary cause

of a fistula, and the case of pancreatic fistula reported in this paper is an example of this. The primary cause of the fistula in our 37 cases is shown in Table 2.

Table 1 Cases of Abdominal Fistula Arranged According to Year of Examination

YEAR	NO OF CASES	NO OPERATED ON
1927 (Apr-Dec)	2	2
1928	1	1
1929	1	1
1930	4	0
1931	2	0
1932	5	5
1933	2	2
1934	5	3
1935	6	4
1936	6	6
1937 (Jan-Mar)	3	3
Total	37	27

The commonest cause of abdominal fistula is infection which produces gangrene and perforation of the bowel. In our series, appendicitis, diverticulitis of the colon and regional ileitis accounted for 23 of the cases. When the cecum was

Table 2 Cases of Abdominal Fistula Arranged According to Etiology

ETIOLOGIC FACTOR	NO OF CASES
Appendicitis perforated	10
Diverticulitis of sigmoid perforated	9
Regional ileitis, perforated	4
Pelvic operation (other than for tuberculosis)	4
Pelvic operation (with tuberculosis)	2
Carcinoma of colon	3
Trauma to abdomen	2
Gastric operation	2
Richter's hernia ileum	1
Total	37

the point of origin, the fistula usually resulted from a direct extension of an appendicular infection to the cecal wall and was caused by sloughing of the wall from a severe fulminating infection, which produced gangrene. This occurred in 10 of the cases in which the primary condition was

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Surgeon, Lahey Clinic.

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mize it and will also shorten the hardening time. Since this product began to be supplied in hermetically sealed cans, thus eliminating the necessity for exposure of acetone in an open basin, those applying the material have noticed much less odor.

Another objection is that the setting time is long. The chemical substances that are known to lessen this period are too explosive and too dangerous to be considered. We have especially in mind propylene oxide. Efforts are now being made to



Figure 14 Models of leg casts: left leg cellulose compound; right leg plaster of Paris.

solve this problem. Yet even a setting time of as long as forty minutes does not preclude the use of this material, either for freshly reduced fractures, or in the convalescent stage of bone repair or under other conditions requiring fixation.

Those familiar with the use of pyroxylin, "air-plane dope," and similar products maintain that they shrink cloth so rapidly and completely that they could not be employed in a fixative bandage of this type. Our answer is that we have minimized shrinkage — (1) by using a special pyroxylin containing only 12 per cent nitrogen (instead of the ordinary 16 per cent), (2) by adding boric acid, and (3) by selecting a fabric cut on the bias, which permits the cloth to take up the shrinkage while drying.

The fourth objection is inflammability. This cannot be denied, however, the addition of boric

acid and the employment of pyroxylin containing only 12 per cent nitrogen have greatly reduced the inflammability. When the casts are thoroughly dry, that is, on the day after their application, they are no more inflammable than is wood. Sealing the moistened bandage in cans makes storage as safe as that of ether, and much safer than that of bottled collodion. The bandage is inflammable when wet, but much less so than collodion or ether, and it may be handled more safely than either.

The constituents and physiochemical properties involved are of interest. The hardening principle is entirely different from that of crystallization in plaster-of-Paris. Colloidal chemistry is involved, and hardness is achieved by evaporation with its gradual formation of millions of films in and around the fabric. The rigid bandage contains pyroxylin, boric acid and acetone. The boric acid, which is soluble in acetone, forms through the films myriads of particles which effectively diminish combustion. Twelve-per-cent nitrogen pyroxylin is less inflammable than ordinary collodion, and the final product is less dangerous than the modern x-ray film. The development of a pyroxylin of low viscosity makes it possible to include a large volume of pyroxylin in a given amount of plasticizer or solvent, and thus allows a tremendous film-forming concentration, which permits extreme rigidity.

No skin irritation has been observed in casts made of this bandage, many of which are applied or worn next the skin. No irritation would be expected from the individual constituents. Collodion is used therapeutically on irritated skins (treatment of poison ivy, herpes zoster, and so forth), and so is boric-acid powder. Acetone is an important part of Scott's solution, used to prepare skin and mucous membranes for operation.

At present the method appears to be most suitable for the convalescent care of fractures. The slower hardening renders its use in acute fractures more difficult, although not impossible. The material's being pervious to x-ray is an advantage in the fluoroscopic room, and later in following the progress of bone healing by callus formation. Much less bandage is required to supply the desired rigidity than is the case with plaster-of-Paris, and this makes the cost comparable to that of a plaster cast.

SUMMARY

A preliminary report is given of a useful type of material for making rigid casts. It is rolled or molded in similar fashion to plaster-of-Paris bandage. When dry it is waterproof, very light, ex-

most instances. A complete history frequently gives more accurate information as to the origin of the tract than does the roentgenologic examination, nevertheless, the latter should always be made, so as to establish the presence of obstruction, which is so often present, and also to indicate the pathologic condition involved. A roentgenologic examination made after injecting lipiodol into the fistulous tract will aid in determining the origin of the tract. It is necessary that the surgeon visualize

Table 3 *Cases of Abdominal Fistula Arranged According to Duration*

DURATION	NO. OF CASES
1 to 6 mo	13
7 mo to 1 yr	7
2 yr	6
3 yr	3
4 yr	3
5 yr	1
6 yr	0
7 yr	1
8 yr	2
17 yr	1
Total	37

as accurately as possible the condition underlying the fistula, so that he may plan the scope of the surgical procedure needed to eradicate it. As pointed out previously, regional ileitis may have

a perforated appendix. The roentgenogram revealed a typical picture of regional ileitis, for which resection of the terminal ileum and ascending colon was necessary in order to obtain a cure. Needless to say, such an operation is a highly technical procedure, and involves a much greater risk than a simple closure of an opening into the cecum. Roentgenologic examination will also reveal the condition resulting from a diverticulitis of the colon, the presence or absence of obstruction and the presence or absence of fistulas in other viscera, and will assist materially in the planning of a sound surgical method. Following a severe inflammatory process in a colon which is studded with diverticula, the bowel is often thickened and stenosed from scar tissue, and this cicatrization and stenosis are likely to be permanent. The diverticula are readily outlined by a barium contrast enema, and the point of obstruction can be clearly seen (Fig 2).

In our series the duration of the fistulas varied between two months and seventeen years, 24 patients had had an abdominal discharge for more than six months, and 1 had had a discharge for seventeen years (Table 3).

It is true that a fistula of the cecum or of the small bowel is not usually a serious complication in

Table 4 *Data on Twelve Cases of Abdominal Fistula with a Duration of Less than Six Months*

AGE AND SEX	DURATION mo	CAUSE	REASON FOR OPERATION	OPERATION	FINAL RESULT
42 F	2	Multiple pelvic operations	Fibroid uterus subovarian abscess fistula	Hysterectomy salpingo-oophorectomy	Fistula healed spontaneously 2 mo. after operation
37 M	3	Perforated appendix	Symptoms of obstruction	Operation advised did not come in	Healed spontaneously 1.5 yr later
34 M	3	Gastric operation	Jejunal fistula jejuno-colic fistula	Resection of jejunum	Died peritonitis
35 F	2	Operation for drainage of pelvic abscess	Bilateral subovarian abscess	Hysterectomy salpingo-oophorectomy	Persistent fistula 3 yr later
39 F	4	Perforated diverticulitis of sigmoid	Obstruction of sigmoid	Resection of sigmoid	Cured
50 F	1	Perforated diverticulitis of sigmoid	Obstruction of sigmoid	Resection of sigmoid	Cured
41 M	3	Trauma of abdomen enterostomy	Chronic intestinal obstruction	Resection of ileum	Cured
52 F	2	Multiple pelvic operations	Fibroid uterus	Hysterectomy with fistula resulting	Healed spontaneously 2 mo after operation
72 M	3.5	Perforated diverticulitis of sigmoid	Operation advised against because of age	None	Persistent fistula
67 M	2	Perforated appendix	Chronic intestinal obstruction	Resection of ileum and cecum	Died pneumonia
37 M	3	Regional ileitis with perforation	Regional ileitis	Resection	Died peritonitis
18 M	3	Trauma of abdomen ruptured pancreas	Drainage pancreatic fistula	Transplantation of fistula into jejunum	Cured

Fistula occurred after operation at the clinic

been the primary cause of a persistent abdominal discharge, if such is the case a much more radical operation will be required, and this must be planned for preoperatively. The case of a woman of twenty-three, with a fecal fistula of two years' duration, illustrates this well (Fig 1). Two operations had been previously carried out elsewhere for closure in the belief that the fistula arose from

the majority of cases, and most such fistulas tend to close without a major operation, this is particularly true if there is no obstruction of the bowel. Because of this we have carefully eliminated from our study many of the fistulas that occurred after operation for perforated appendicitis, and those which occurred after cecostomy or enterostomy had been carried out, in which healing resulted within

appendicitis Diverticulitis of the sigmoid flexure of the colon with perforation and formation of abscess was the cause of most of the left-sided abdominal fistulas, in 9 patients the fistula was of this origin In each of these cases the history was clearly that of diverticulitis, with formation of a fistula after drainage of an abscess in the left lower part of the abdomen On the other hand, when the small intestine was involved the fistula more commonly followed a secondary oper-

a perforation of the ileum With one exception all these had been referred to us after what was thought to have been an operation for a perforating appendicitis Four other cases in which the fistulous communication entered the small bowel apparently resulted from trauma, 2 of these followed gastric operations, 1 was caused by an injury to the ileum in a hernial sac, and 1 followed a severe injury to the abdomen Fistulas of the



Figure 1 Filling defect in the terminal ileum with moderate stasis and distention proximal to defect may be noted, the cecum also shows involvement with this inflammatory process

ation for pelvic abscess or for intestinal obstruction, and frequently it was caused by trauma to the small bowel In 6 cases in which a pelvic operation had previously been performed, an injury to the small bowel or to the rectosigmoid resulted from difficult operative procedures, and in each case the operation was complicated by serious adhesions resulting from previous surgery Regional ileitis must always be seriously considered as a cause of a right-sided abdominal fistulous tract, and in most cases in which the fistula is found to arise in the terminal ileum it proves to be the result of a localizing ileitis of this type We have operated on 15 patients with regional ileitis, of whom 4 had fistulas which arose from



Figure 2 Diverticulosis and diverticulitis of colon. The arrow points to irregular constriction caused by diverticulitis After the colon was emptied multiple diverticula were demonstrated

colon infrequently follow contraction of a colonic stoma, as in a series of 135 Mikulicz resections of the colon for carcinoma only 3 persistent fistulas have occurred subsequent to closure of the temporary stoma This complication is most often associated with an improper secondary closure of the stoma, and is caused by an obstruction to the passage of the intestinal contents through narrowing of the lumen of the bowel at the level of closure We have had but 1 case of persisting pancreatic fistula, and this originated from traumatic rupture of the pancreas, caused by injury to the abdomen received while playing football The case was successfully managed by transplantation of the fistula into the jejunum

The discharge of fecal material through an opening in the abdominal wall establishes very clearly the diagnosis of a communication with the intestine The source of a discharge, nonfecal in character, also may be determined readily, since the fluid can be identified by simple laboratory procedures, as in our case of pancreatic fistula The history may be of great assistance in establishing the part of the intestine involved, if it is studied in detail the origin of the fistula can be determined in

discharge. If the communicating sinus does not penetrate deeply into the abdominal cavity it may be removed without a wide opening into the peritoneal cavity. By far the larger number of cases require free, wide incision of the abdominal wall, a thorough release of adhesions, and open dissection of the tract, so as to obtain good exposure and protect the unaffected viscera with abdominal pads. If the tract can be followed throughout its course by the induration and thickening of its walls, the opening in the skin may be closed after complete dissection of the tract, leaking and contamination of the surrounding tissues thus being avoided. Traction upon the dissected part often outlines its direction. In some cases it is necessary to pass a probe along the course of the fistula as a guide in dissection.

The variety of methods of dealing with abdominal fistulas can be illustrated best by presenting 6 successfully treated cases, and describing the operative method employed in each case.

CASE REPORTS

Case 1* A man, aged 54, entered the New England Deaconess Hospital on December 1, 1936, for treatment of a fecal fistula in the right lower quadrant, which had

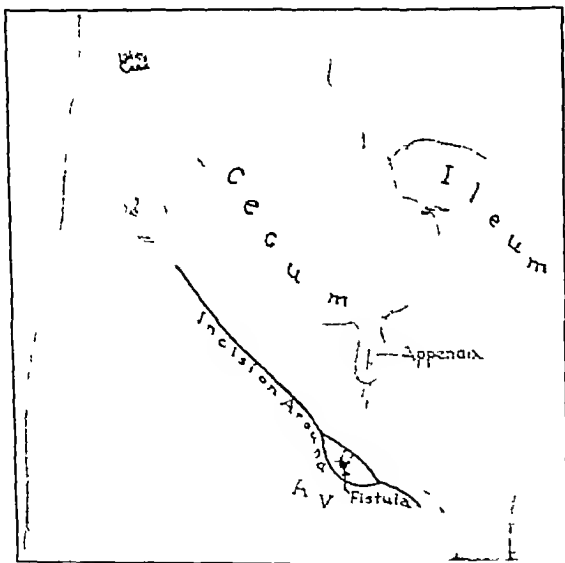


Figure 4 Reproduced by courtesy of *Surgical Clinics of North America* (17:791 1937). Location of the fistulous opening and the incision used in the operation are illustrated. The relation of the cecum and the appendix to the fistulous tract is demonstrated.

been present for one year. A femoral hernia on the right side had been repaired elsewhere in 1922, in 1927 an abscess developed in the operative scar, which opened and drained for 7 weeks, complete healing taking place after the discharge of a fecalith. In 1934 drainage was insti-

tuted for a gangrenous appendix, at this time the scar of the femoral hernia again opened and purulent material drained, both wounds healed after 10 weeks. A fecal fistula developed in the scar of the femoral hernia about 1 year before the patient was admitted to the clinic.

Physical examination revealed a draining fistula in the center of an oblique scar just below Poupart's ligament (Fig 4). Roentgenologic examination after injection of lipiodol revealed a large sinus, apparently connected with the large bowel.

At operation, December 3, an oblique incision was made parallel to and below Poupart's ligament, encircling the

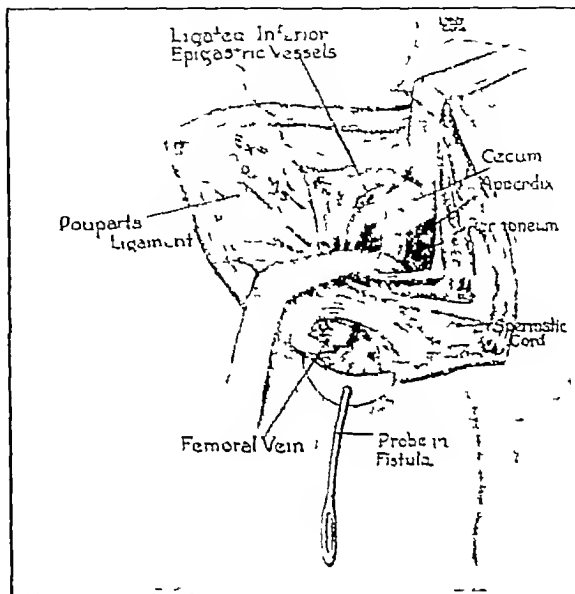


Figure 5 Reproduced by courtesy of *Surgical Clinics of North America* (17:793 1937). The operative dissection is illustrated. The tract has been cleanly dissected from the femoral vein and is shown entering the stump of the appendix. Adequate exposure of the appendix and cecum is obtained by incising the fibers of the aponeurosis of the external oblique muscle and retracting the internal oblique and transversalis muscles. The peritoneum is opened but the operation is extraperitoneal because adhesions adequately protect the main peritoneal cavity.

fistulous opening in the skin. A probe was inserted into the sinus as a guide, and the tract was dissected free from the femoral vein up to the femoral ring (Fig 5). An incision was then made above the inguinal ligament through the aponeurosis of the external oblique muscle, the internal oblique and the transversalis muscles were retracted, and the peritoneum was opened. The deep epigastric vessels were divided between ligatures so as to give better exposure. The cecum with the appendix was easily identified, and was found to be well walled off with adhesions from the general peritoneal cavity, so that the latter was not opened. The tract was completely dissected, and the appendix, which opened directly into the tract, was removed and the stump carefully inverted. The femoral opening was then closed by suturing Poupart's ligament to Cooper's ligament. The muscles and fascia of the abdominal wall were closed in layers and a drain was placed in the region of the femoral canal. The patient was discharged 23 days after operation with only a slight seropurulent drainage from the wound. On February 27, the wound was entirely healed.

*Cases 1, 2, and 3 have been reported elsewhere (Marshall S. F. The surgical management of fecal fistula. *S. Clin. North America* 17:787 '37).

a few weeks. In such cases, provided no accompanying pathologic change can be demonstrated, the wound closes spontaneously and operation is unnecessary. We have included only the cases in which the fistula was permanent and in which there was no tendency of the lesion to heal spontaneously. Twelve patients, however, are included who had had fistulas for six months or less, most of whom required operation for relief. Table 4 presents these cases briefly and explains the necessity for operation.

If the more conservative measures, such as strapping with adhesive tape, cauterizing the edges of the openings, and simple closure with buttons (Fig. 3), do not result in cure, more radical operation is indicated. The operation for relief in these cases may be a serious one, it frequently taxes the ingenuity of the most experienced surgeon and calls for the highest degree of surgical judgment and skill. The operative technic must be planned for each case, and frequently the method of attack can be determined only as the condition is revealed at operation. The surgeon must in most cases anticipate an extensive procedure, must expect that a painstaking dissection will be necessary to eliminate the fistulous tract, and must guard against gross contamination of the peritoneal cavity from the spilling of intestinal contents or infected draining fluids. One of the more serious problems is the sterilization of the skin, which is almost impossible, and the prevention of local infection or peritonitis, since sterilization of the surrounding tissues cannot be satisfactorily obtained. Fortunately, in individuals who have had long-standing abdominal infections a marked local immunity develops and these wounds tend to heal readily without the development of serious inflammatory processes.

Another problem of importance is the determination of the presence of an intestinal obstruction. In practically every one of our cases one or more attempts at operative closure had already been made elsewhere. Failure had resulted because the problem of obstruction was not recognized. If the inflammatory process and scarring has produced marked narrowing of the intestinal lumen, this must be relieved. In many cases resection is necessary, and in such instances, particularly in the small bowel, we prefer to re-establish the intestinal lumen by closing the resected ends and performing a lateral anastomosis. It is our opinion that a lateral anastomosis in the presence of obstruction is safer than and preferable to an end-to-end anastomosis, because of the disproportionate size of the hypertrophied proximal intestinal loop, which does

not lend itself readily to an end-to-end anastomosis with the collapsed distal segment. A simple short-circuiting operation in these cases is unsatisfactory unless the fistulous tract is removed. If it is not, the fistula will continue to discharge either because of reverse peristalsis or because only a portion of the fecal current has been diverted.

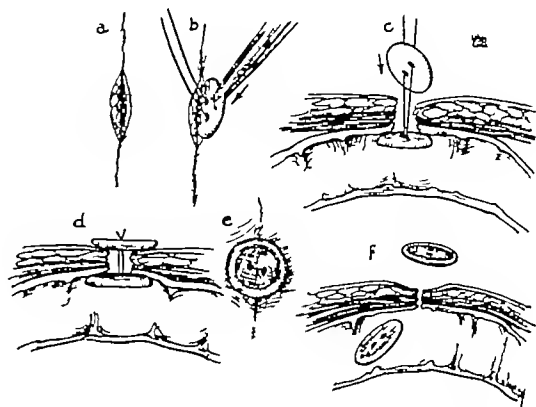


Figure 3 Closure of fistulous opening with button technique. The opening is enlarged by incising, and an ordinary bone button is threaded on silver wire, introduced through the opening into the bowel, and anchored in place by tying a second button over the external opening.

When obstruction is associated with a fistulous tract communicating with the large bowel we prefer to employ a Mikulicz type of resection in addition to the excision of the tract, because of the greater margin of safety associated with this type of operation. This is especially true in the sigmoid flexure, where a high degree of obstruction frequently accompanies diverticulitis with an associated fistula. It must be emphasized also that in order to obtain permanent closure the tract must be completely excised, the thick, irregular, indurated edges of the opening into the bowel being entirely removed, and only relatively normal bowel wall being sutured. If the opening into the bowel is small, closure may be obtained by simple suture, otherwise, provision for restoration of an adequate lumen must be made.

Two methods of attack are useful in the eradication of fistulous tracts, one extraperitoneal and the other transperitoneal. Very few fistulas can be removed satisfactorily by extraperitoneal closure, even though this is the safest method and should be used whenever possible. This is particularly true of a fistula of the small intestine, because there is usually either a kinking of the intestine, or a narrowing of the lumen, which by obstruction leads to the persistence of the fecal

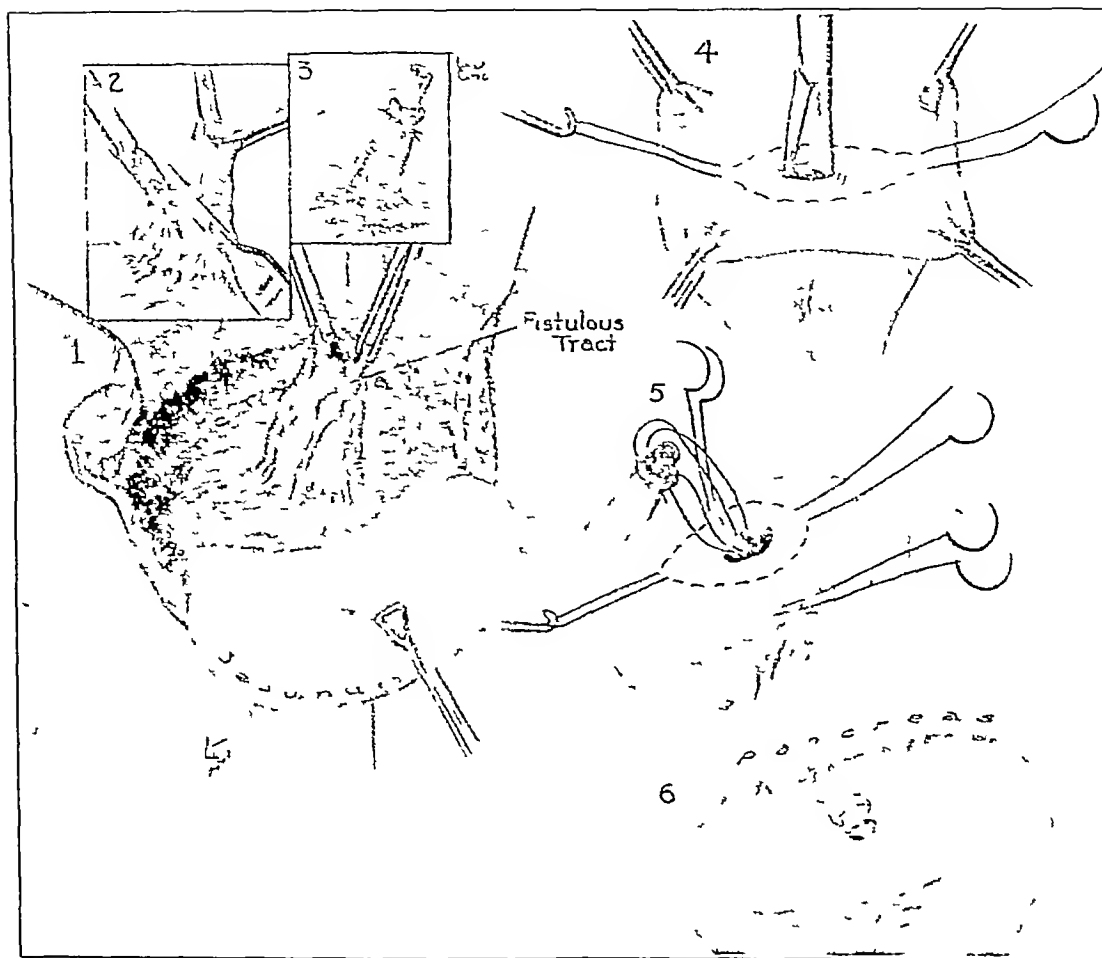


Figure 7 Reproduced by courtesy of *Surgery Gynecology and Obstetrics* (64 78 1937) Steps used in pancreaticojejunostomy (1) Fistulous tract to the pancreas cored out from the abdominal wall. Note the defect remaining on the right side of the incision where the tract was cored out. The jejunum has been brought up over the transverse colon preparatory to implanting the tract in it. (2) Paring the thick wall of the tract down to its base. In doing this special care must be exercised lest the wall of the tract be pared too thin perforated and the tract spoiled. (3) The prepared fistulous tract with a short section of catheter tied into it so that the purse string suture by which it is to be buried into the jejunum will not occlude it. Note the cuff of scar tissue left at the base of the tract to be attached to the jejunum to prevent the bowel's pulling away while the fistula is healing into the jejunum. (4) The method of preparing the opening into the jejunum for the implantation. The best opening with the least bleeding is made by forcing a closed sharp-pointed

goiter hemostat through the jejunum after the purse string suture has been inserted, and with the jejunum held in intestinal forceps. As here shown this opening with little or no bleeding can be dilated by the forceps to any size desired. (5) Two silk sutures which catch the end of the fistulous tract and are passed into the opening in the jejunum and out close to the mesentery. The traction sutures make it possible to guide the tract into the jejunum which even then is not an easy procedure. With the tract well inserted into the jejunum the purse string suture is tied snugly about the neck of the fistula until the tube in it obstruction will not result. The fine silk guide sutures emerging through the wall of the jejunum are now cut and withdrawn. (6) The cuff of scar tissue left at the base of the fistulous tract is now fixed to the wall of the jejunum by interrupted silk sutures front and back to prevent escape of the fistulous tract from the bowel and the operation is completed.

dominal exploratory operation had been done elsewhere 2 days after the accident, when a hemorrhage into the gastrosplenic omentum was revealed. A drain was inserted and the fluid from this drain proved to be pancreatic juice. Drainage continued for 7 weeks, when the patient left the hospital. The following day the fistula reopened. On December 30, 1935, roentgenologic examination elsewhere revealed a cavity to the right of the midline and about halfway between the anterior abdominal

wall and the spine, which was about 11 cm. in oblique diameter and 5 cm. in vertical diameter.

On examination at the clinic it was found that the abdominal incision was healed, in the upper third of the scar there was a fistulous opening which was discharging clear, opalescent fluid. A catheter was inserted into the sinus tract in order to collect and measure the fluid and to avoid leakage. Roentgenologic examination after lipiodol and sodium iodide had been injected revealed a

This case illustrates a fecal fistula arising from an appendix. The history points accurately to the appendix as the source of the fistula. In this case we were able to excise the tract and close the opening in the cecum without opening the general peritoneal cavity, which materially reduced the operative hazard.

Case 2 A man, aged 44, entered the New England Deaconess Hospital on February 27, 1937, because of a hernia in the right groin. At the age of 7 he had been ill subsequent to the development and drainage of an abscess in the right inguinal region. The sinus had drained for

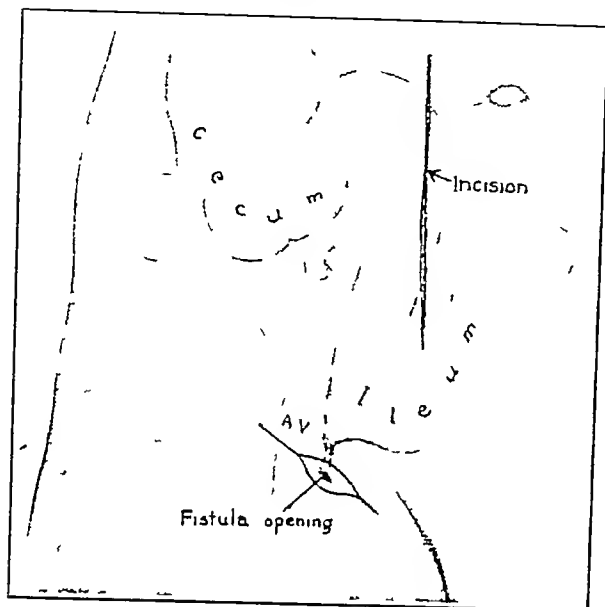


Figure 6 Reproduced by courtesy of *Surgical Clinics of North America* (17:795, 1937). *Fistulous tract entering terminal ileum through femoral canal is demonstrated. The locations of the incisions are shown. This fistula followed a Richter's hernia of the small bowel.*

a long time but finally healed. He had had no further trouble except for a hernia in the right groin. One week before admission tenderness and induration had developed in the groin. An opening formed in the scar through which fecal contents drained.

Physical examination revealed a draining fecal fistula opening over the femoral canal just below Poupart's ligament. Palpation revealed the presence of a femoral hernia, gurgling of the intestinal contents beneath the skin was easily demonstrated. A diagnosis was made of a fecal fistula probably arising from a Richter's hernia of the small bowel.

At operation, the abdomen was opened through a right paramedian incision (Fig. 6), and the terminal ileum 15 cm. from the ileocecal valve was found to be adherent on its antimesenteric border to the sac of a femoral hernia. The fistulous tract entered the bowel, it was excised from the intestinal wall. The opening into the ileum was closed transversely and the lumen was not narrowed. The hernia was then repaired from within the abdominal cavity and the abdominal wall was closed without drainage. An oblique incision was made below and parallel to Poupart's ligament, the draining sinus was freed from the femoral vein by careful dissection, and the entire fistulous tract was removed. This incision was closed without drainage.

Recovery was uneventful and the patient was discharged 21 days after operation, when there was only a slight serous drainage from the inguinal incision.

This case illustrates a transperitoneal approach to a fistula of the small bowel which arose from a Richter's hernia of the terminal ileum into a femoral sac.

Case 3 A woman, aged 36, entered the New England Deaconess Hospital on February 13, 1937, because of a draining abdominal sinus of 4 years' duration. In 1919 an abdominal operation had been performed for a tuberculous abscess. The patient was confined to bed for 8 months and made a slow recovery. In 1933 an operation was done for a fibroid tumor and a second pelvic abscess was drained. After this operation the patient was confined to bed for 13 months. An abdominal fistula had persisted since that time. Undigested food was discharged from the fistula 2 or 3 hours after ingestion. The patient had had attacks of severe lower abdominal pain every 1 to 3 weeks, and these were followed by increased drainage from the fistula. Constipation had always been a marked feature.

Examination of the thorax did not reveal any evidence of tuberculosis, nor did the roentgenogram. There was a fecal fistula in the midportion of the suprapubic scar, and a fixed mass, adherent to a normal sized uterus, in the right side of the pelvis.

At operation, the midline suprapubic scar with its fistulous tract was excised and the peritoneum was opened. The pelvis was filled with adhesions, and the sigmoid flexure and rectum were densely adherent to the uterus. A firm, fixed mass filled the right side of the pelvis, and a probe passed through the fistula entered this mass. The left tube and ovary had been previously removed. After a painstaking dissection a supravaginal hysterectomy was done, and the right tube and ovary, which comprised the mass on the right side, were removed. The fistula entered the ileum, which was scarred and partially obstructed. The fistula was excised and the intestinal opening was closed, but this produced so much narrowing of the lumen of the bowel that it was necessary to perform an anastomosis between the terminal ileum and the transverse colon. A drain was inserted into the pelvis through the abdominal wound because of the marked degree of secondary infection present, although this procedure was considered undesirable because of the diagnosis of tuberculosis. The drain was removed within a few days. The patient made an uneventful convalescence and was dismissed 26 days after operation, at which time there was a slight serous drainage from the lower end of the incision. This drainage persisted for 6 months. Dr. Shields Warren reported that the specimen showed tuberculous endometritis, tuberculous oophoritis and tuberculous salpingitis.

This case is an excellent example of a fistula following a secondary operation for drainage of a pelvic abscess, and probably resulted from marked inflammation involving the wall of the ileum. An extensive operation involving much difficult dissection was necessary in order to remove the involved pelvic organs and to excise completely the fistulous tracts. The closure of the small bowel together with an already existing partial obstruction necessitated an enteroanastomosis.

Case 4* A man, aged 18, came to the clinic on January 22, 1936. Three months previously he had been kicked in the abdomen while playing football. An ab-

This case has been reported in detail elsewhere (Lahay, P. H. and Lium, Rolf. Cure of pancreatic fistula by pancreatojejunostomy. *Surg., Gynec. and Obst.* 64:79-88, 1937).

tous and congested, this process extended to the cecum, and the fistulous tracts communicated with the ileum (Fig 8) A Mikulicz type of resection was done, removing 27 cm. of the ileum, together with the cecum and the ascending colon (Fig 9)

The postoperative course was uneventful. The Mikulicz spur was divided before the patient left the hospital Six weeks later she was readmitted to the hospital and the stoma was closed, 14 days following this closure she was dismissed, with the wound entirely healed.

It is evident that regional ileitis preceded the develop-

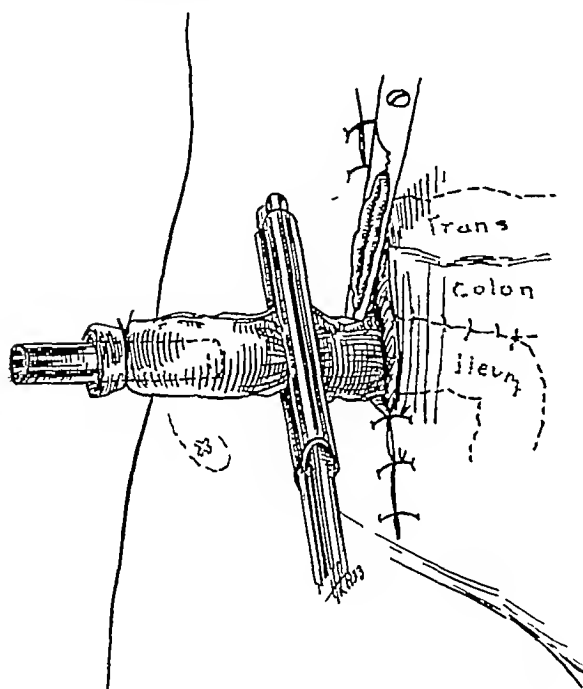


Figure 9 Reproduced by courtesy of New York State Journal of Medicine (34 135 1934) Method of resection illustrating the Mikulicz type of resection of the terminal ileum and ascending colon The transverse colon and terminal ileum are brought through the abdominal wound forming the Mikulicz stoma The ileum is staggered so that a drainage tube can be tied within the lumen and immediate drainage of the small bowel obtained

ment of this fistula, perforation occurring after appendectomy had been performed Failure to recognize the condition readily accounts for the unsuccessful attempt at closure The history and examination strongly suggested regional ileitis, and we were fully prepared for the major operative procedure. In cases of regional ileitis a perforation may either occur into adjacent loops of bowel, or produce an external fistulous opening This condition should always be considered as a source of a fistula in the right part of the abdomen. It is obvious that any attempt at extraperitoneal closure of these tracts is doomed to failure. The best results, in our experience, for the control of the ileitis as well as the eradication of the fistula are obtained by resection of the affected loop of bowel In a series of 15 cases of regional ileitis, resection was performed in 9 cases without a death.

In our series of 37 cases of abdominal fistulas, 27 patients were submitted to operation, 5 died after operation, an operative mortality of 19 per cent Ten others were advised to have an operation but refused Of the 27 patients operated on,

permanent closure of the fistula was obtained in 19 (Table 5) Serous material but no fecal contents continued to drain from the fistula in 2 cases in which there was an associated tuberculosis of the pelvic organs Both of these patients were much improved in health following operation

It is of interest to review the pathologic changes in the 5 cases in which death occurred following operation In 1 case peritonitis occurred following an extensive operation for repair of a jejunal

Table 5 Operated Cases of Abdominal Fistula Arranged According to Result

RESULT	NO OF CASES
Complete cure	19
Persistent fecal drainage	1
Died following operation	5
Drainage (tuberculosis) no fecal drainage	2
Total	27

fistula associated with a jejunocolic fistula, which had developed after multiple gastric operations had been performed These cases are serious problems, peritonitis is one of the most dreaded sequelae, and is the cause of death in most instances It occurred in another case after operation for a fistula which had formed after an appendectomy At operation numerous external and internal fistulas were found and an extensive resection of the bowel was necessary Death occurred on the third postoperative day Pneumonia accounted for a fatal outcome in a man of sixty-seven who on admission had had an intestinal obstruction complicating a long-standing fecal drainage Another death followed operation on a patient who had regional ileitis, an ileocolostomy was performed because of his poor condition, but death from inanition resulted three months after operation In the fifth case death occurred at home two months after dismissal from the hospital, at which time the patient apparently was in good condition, the cause of death is unknown

SUMMARY

A study of 37 cases of persistent abdominal fistulas is presented The pathologic condition involved in their production is discussed

The method of determining their origin and the reason for their persistence are outlined Many operations for closure of abdominal fistulas result in failure because the underlying pathologic condition has not been recognized

A general discussion of the principles involved in the surgical treatment is given The operation is a serious one, and in most cases requires extensive technical procedures

Six cases of fistula are reported, together with the operative method employed for the eradication of the fistula in each case

Of 27 patients who submitted to operation, com-

cystic cavity about one fifth the original size. Because of this reduction in size it was decided to pursue a conservative course of treatment. The patient entered the hospital, laboratory studies were made, and medical treatment was instituted. When the patient left the hospital the sinus had shrunk to the diameter of the indwelling catheter. Because pancreatic juice continued to be discharged and because the patient wanted to be rid of the fistula, we decided to transplant the fistula into the jejunum. For 3 weeks before operation the fistula was gradually dilated from the size of a 14 to that of a 22 French catheter.

On March 16, 1936, 5 months after the original accident, a pancreatojejunostomy was done by one of us (F. H. L.). Spinal anesthesia was used. An incision was made around the fistulous tract and the peritoneal cavity was opened about 5 cm. below the opening of the sinus. All layers were dissected through the peritoneum, first to the left and then to the right of the fistula from below. The fistulous tract passed between the stomach and the transverse colon, and was well surrounded by omentum. It was dissected back toward its base about 5 cm., and was cored away until it was only about 1 cm. in diameter. A 22 French catheter was tied into the sinus with silk, to prevent occlusion of the canal after its implantation (Fig. 7). A loop of jejunum was brought up, and with a Babcock clamp on each corner of a rectangular area opposite the mesentery a straight clamp was punctured through the wall of the jejunum. The blades of the clamp were separated, the opening was dilated, and a purse-string suture was placed around this opening and left free. A silk suture was placed on each side of the end of the fistula. These sutures were then brought through the wall of the jejunum and were used to draw the fistula into the jejunum. This maneuver was executed with considerable difficulty. The purse-string suture was then tied, and a row of interrupted catgut sutures was placed between the omental neck of the fistulous tract and the jejunum. Finally a continuous suture was placed between the omentum and jejunum. At the end of the operation the fistulous opening could be felt well within the jejunum, and there was no encroachment on the lumen of the jejunum. The abdomen was closed without drainage, using interrupted silk through and through sutures.

Convalescence was uneventful except for slight sepsis of the wound, which had cleared up entirely by the 12th day after operation. The patient left the hospital in good condition on the 17th day after operation. He has remained well and free from symptoms.

Case 5. A woman, aged 39, entered the clinic on February 16, 1934 because of draining abdominal fistulas. Operation had been performed elsewhere on October 11, 1933, following an attack of pain and tenderness in the left lower part of the abdomen. A perforated diverticulum had been found and apparently resection of the sigmoid flexure with an end-to-end anastomosis had been done. Fecal drainage immediately followed this operation, and on January 12, 1934, an attempt was made elsewhere to close the fistulas, but without success.

Examination revealed three draining fistulas in a left rectus scar. Roentgenologic examination after injection of the fistulous tracts with lipiodol showed that they communicated with the sigmoid flexure of the colon. Examination after a barium enema had been given revealed the presence of numerous diverticula of the colon and a region of narrowing at the level of the fistulous tracts.

In order to divert the intestinal stream, a transverse ileostomy was performed on February 19. Twenty days later the abdomen was opened widely and the fistulous

tracts were excised. A Mikulicz type of resection was necessary to remove the affected part of the sigmoid flexure. Convalescence was uneventful and the wound healed satisfactorily. The stoma in the ileum was closed on May 11, and 13 days later a plastic closure was done on the stoma in the sigmoid flexure. Healing without drainage resulted after 13 days. Examination 6 months after operation showed complete healing, and the patient was in excellent health.

The operation for eradication of fistulas arising in the left portion of the colon is likely to be a highly technical procedure. In most cases resection is required, and occasionally the diverticulosis may be so extensive that the continuity of the bowel cannot be re-established and the patient is left with a permanent colonic stoma. The possibility that a permanent opening will be required should always be considered, and the patient should be so advised before operation is undertaken. Occasionally, if no obstruction is present, the operation may be simple, consisting of an extraperitoneal closure of the openings in the colon and simple excision of the tracts. We have been able to do this in 2 cases in which the fistulas originated from diverticula.

Case 6. A woman, aged 22, was admitted to the clinic on March 3, 1937. Appendectomy with drainage had been done in January, 1935, because of pain and tenderness in the right lower quadrant of the abdomen. Fecal discharge through the appendectomy wound soon followed this op-

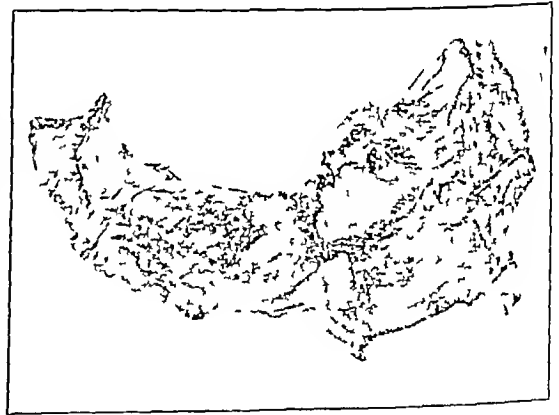


Figure 8. The terminal ileum is thickened, edematous and congested. Marked ulceration with almost complete obstruction of the terminal ileum may be noted. This ulcerative process extended to the cecum, and the fistulous tracts communicated with the ileum.

eration, and it had persisted. A second operation was performed 6 months later in an attempt to close the fistula, but without success. The fistula had continued to drain, the patient had lost weight, and had had attacks of vomiting and recurrent pain in the right lower part of the abdomen.

Examination showed an undernourished patient. Two draining fistulas were found which opened into the mid part of an oblique scar in the right lower part of the abdomen. Roentgenologic examination revealed a moderate filling defect in the terminal ileum with mild ileal stasis and distention proximal to this defect. The tentative diagnosis of regional ileitis was made.

Operation was performed April 7, 1937. The old scar with the fistulous opening was excised and the abdomen was opened. The terminal ileum was thickened, edema-

EARLY DIAGNOSIS OF SCHIZOPHRENIA BY THE GENERAL PRACTITIONER

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THE difficult problem of the treatment of schizophrenia (*dementia praecox*) has recently aroused considerable attention because of the claims set forth for new therapeutic techniques. In this way facts of pronounced social significance concerning this disease have been brought to light. Outstanding among them is the revelation that most patients suffering from this disorder are brought to hospitals at an astonishingly late stage.

The incidence of schizophrenia is low as compared with that of diseases not directly associated with the brain. Pollock¹ states on the basis of the Federal Census of 1920 that the average annual rate of *dementia praecox* first admissions per 100,000 population during that year was 18.6 for males and 16.4 for females. On the other hand, there is a comparatively low spontaneous remission rate. Fuller² has followed a group of 600 male and 600 female schizophrenics for fifteen years after their first admission. He reports that at the end of that period 38.4 per cent are still in hospitals, 25.0 per cent have died and 36.6 per cent have been discharged. It is to be noted that of the total discharged patients only 12.4 per cent were considered recovered. These figures bring out a condition of great importance, both economic and social, namely, the disease is characterized by a low recovery rate, so that patients tend to accumulate in hospitals. There is also a moderate infiltration of the general population with partially recovered individuals who make a definite contribution to the crime and disease rates, and also to the incidence of problem behavior in children.

The effects of this infiltration cannot at present be computed, but the results of accumulation in hospitals can be. In the Massachusetts state hospitals in 1936 schizophrenics comprised 15.9 per cent of total first admissions, while they accounted for 39.0 per cent of the first-admission resident hospital population. Similarly, during that year only 23.1 per cent of the patients readmitted to hospitals were schizophrenic, but 62.3 per cent of hospital residents who had been readmitted were so diagnosed.

On September 30, 1936 the total number of schizophrenic patients in the Massachusetts state hospitals was 12,212. The per capita cost was estimated at \$775 per week. Consequently the direct annual cost of these patients, leaving out of ac-

count the loss in earning power, amounted to approximately \$5,000,000.³

The incidence of schizophrenia in the general population will be shown more vividly if we realize that it first begins to appear at the approach of puberty. From then on the curve soars rapidly to reach its crest at about the thirtieth year. It then subsides gradually until the fiftieth year, after which practically no cases appear. Furthermore, the incidence among the rural population is much less than that among city-dwellers. Pollock and Nolan⁴ report that this rate in the urban population of New York State from 1915 to 1920 was 19.1 per 100,000 population, while in the rural communities it was 7.8. There is a slight tendency, represented by the ratio 113:100, for schizophrenia to appear in men more frequently than in women.

Reducing these figures to terms of everyday experience, one may expect that most of these patients will come to the general practitioner not from schools but from factories, stores, universities, transportation services, the professions, and other fields of work in which young men and women begin their careers. A fair number of cases will follow the first few pregnancies and so occur during early married life. A limited number of patients will come from farms and from groups in other outdoor occupations.

The influence of heredity is extremely difficult to gauge. It is still unusual to find reliable records for several generations, and it is almost impossible to ascertain whether abnormalities in the offsprings of schizophrenics are due to inheritance or to the environment created by the parents. There is, however, general agreement that from the point of view of the healthy development of children such environments are undesirable.

RELATION OF DURATION OF ILLNESS TO THERAPEUTIC RESULTS

The therapeutic attack waged for decades on this disease has been active but relatively unsuccessful. Procedures have recently been developed for which much is claimed. Proof of such claims is still lacking, and their validation has been made even more difficult because a considerable number of schizophrenic patients come to hospitals late, as a result, their condition is relatively hopeless and comparable to that in cancer after metastases have developed, or to that in pulmonary tuberculosis after cavitation.

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plete closure was obtained in 19. Any operation designed to eradicate these fistulas is likely to be extensive, and because of this carries with it a high mortality (19 per cent).

DISCUSSION

DR LAHEY. There are two or three important points to emphasize in connection with this paper. One is the value of the button method. We did not originate this idea. I found it somewhere in the earlier literature. If you have not employed buttons, you will do well to remember that they will save lives in occasional cases of duodenal or jejunal fistula. We now have a patient who had a gastroenterostomy, then a gastrojejunal ulcer, which was removed. He then had a jejunostomy, and following the establishment of a jejunal fistula he lost weight at the rate of about 1 lb a day. We were in despair as to how to save his life, because he was losing weight so rapidly that we could not think of operating. We split the sinus tract, introduced an ordinary bone button on edge with a silver wire threaded into its holes, put another button on top, and brought them together by twisting the silver wire. This controlled the fistula well enough so that the patient immediately began to regain his weight. At the end of two weeks we cut the wire and let the button pass, and the fistula immediately closed. Several times buttons have saved our patients' lives.

Another matter that I wish to stress is regional ileitis. This paper has, I think, covered all the points regarding fistulas, but I urge that everyone keep in mind the question of regional ileitis. It is occurring constantly. When this paper was first begun, we had had only 15 cases, we have now had 23. I did a resection in such a case day before yesterday. The history is so typical in most of the cases that we should not make many mistakes in diagnosis, nor should we delay until the typical roentgenologic findings of a rigid terminal ileum are found.

Most of these patients have had repeated attacks of pain, usually resembling those of appendicitis. Many have had their appendices removed, but the trouble still continues. The history is one of right sided pain, often with colic and fever, and usually associated with attacks of diarrhea. Late in the disease, the ileum shows definite stiffening, but early it may not be easy to bring out the typical roentgenologic picture of ileitis. Certainly in all the patients who have so-called appendiceal symptoms associated with diarrhea, particularly with each attack, we should consider regional ileitis. Conservative operations for this condition are unwise. They leave the lesion untouched, they permit feces to run through the incompletely obstructed segments, and they tend to produce secondary fistulas. We have performed resections in 15 cases, with no mortality and with excellent results. In the cases in which a lateral anastomosis was made, complications occurred, and there tended to be fistulas into the other segments of the bowel, so that this procedure seems unsatisfactory.

DR H. GILDERSLEEVE JARVIS, Hartford, Connecticut. As regards duodenal and biliary fistulas, we have had 2 cases

sent to us for operation. These patients had had a continuous fistula since their original operation. Each fistula was thought to have been caused by severance of the common duct. In both cases, however, operation revealed a stone in the common duct just distal to the cystic duct, and its removal caused the fistula to clear up entirely. If the common duct has been cut, exploration of the fistula frequently reveals the condition, and at some future operation the ends can be rejoined.

In abdominal fistulas that arise from the gall bladder or the intestinal tract, the first thing to determine is where they originate. We had 1 case in which an abdominal fistula arose from the appendix and came to the surface in the right renal region. The removal of the appendix effected a complete cure.

DR ERNEST M DALAND, Boston. A case of actinomycosis of the large bowel with persistent fistulas came under our care last year at the Massachusetts General Hospital, the patient was a girl of sixteen who had been operated on two years previously for a ruptured appendix. Following this she had had a persistent fistula. A second operation had been done, following which there were two fistulas. There was a third operation, and when we saw her, about 2 years after the first operation, she had five or six fistulas. We examined the pus from the discharge and inoculated guinea pigs with it, but could find no organisms. We made a special search for actinomycetes. The patient developed a subphrenic abscess and a psoas abscess, both of which we drained successfully. The sinuses persisted, and all connected with the psoas space. We then did an anastomosis of the ileum and transverse colon, with some improvement, and the girl was sent home. She returned with a persisting fistula, whereupon a right-sided colectomy was done. In the specimen, the pathologist found one area of actinomycosis, which was the basis of the final diagnosis. After the colectomy the patient did quite well for two weeks, then the blind end of the transverse colon opened and there was again drainage through the psoas wound. We administered large quantities of iodides, and improvement began. Two weeks later she developed an acute obstruction, and in spite of all we could do, she died. No autopsy was obtained.

DR MARSHALL. It is worth noting that most of the cases we have reported were referred to us after several attempts had been made to close the fistulous tract. We must recognize the underlying lesion if we are to be successful in the management of these cases. Extraperitoneal operations will rarely accomplish closure of this type of fistula. This is particularly true of fistulas arising from the sigmoid as the result of a perforated diverticulum. These patients must be warned that operation may be difficult, and in many instances must be told they may be left with a permanent colonic stoma. The reason for the latter is that frequently in the eradication of the fistula and the accompanying lesion for relief of the obstruction, it may be necessary to remove so much of the sigmoid that re-establishment of the intestinal canal cannot be done.

his ambition and his interest in life Rosanoff¹³ refers particularly to lack of interest, and to the slothfulness with which friends and relatives often charge the patient. The failure in capacity in some cases is not of the general nature just described, but is revealed in periodic exhibits of poor judgment and in inability to grasp situations.

Emotional Dulling The majority of investigators of the early symptoms of schizophrenia lay considerable stress on emotional disturbances. These are predominantly of the nature of dulling, though occasionally moodiness or outbursts of irritability may be present. The dulling may show itself simply as part of the syndrome already mentioned under withdrawal. The patient appears to be quite uninterested in what is going on, even matters of great importance may serve to arouse no interest, or a mere show of interest. A further aspect is the relative inscrutability which such patients present to the observers. It is exceptionally difficult to feel in tune with them, for not only have ordinary daily events lost their significance, but matters which seem trivial to the average person begin to acquire special meanings and special emotional importance for the patient. Kretschmer says aptly that it is as though a sheet of glass stood between the observer and the patient. This simile is capable of further extension, for not only is it difficult for the observer to feel in touch with the patient, but it is apparently no less difficult for the patient to keep himself in emotional rapport. Indeed, this symptom may first become conspicuous through the patient's revealing, contrary to his usual custom, occasional unfeeling and callous behavior in dealings with his friends. Maver-Gross¹⁴ has given an excellent description of this gradual loss of the finer sensibilities.

Tendency to Misinterpretation This symptom usually appears rather later than the former three and may be the precursor of definite delusions. In the early stages, however, the patient may, for example, simply have a feeling that people are looking at him or talking about him. The impression may at first be quite transitory, and the patient may either spontaneously or on reassurance realize that he is in error. This feeling that people are not friendly to him or are paying special attention to him may disappear when the patient goes to a new locality, and not recur for several months. Occasionally one encounters patients who for this reason and because their illness has developed slowly, have for years moved from place to place across the country finding a few weeks or months respite in each fresh environment. The tendency to misinterpret may also show itself in other spheres than that of personal relation, for instance, the patient may grow suspicious as to the

purity of his food. At first these symptoms are all on an "as if" basis, the patient claiming that the food tastes as if it were not wholesome, or as if it had been contaminated by some foreign substance.

Less Common Early Symptoms Occasionally, first complaints relate to difficulties in thinking. Difficulty in concentration has already been referred to. A less common symptom is a feeling that the patient's thoughts have suddenly vanished, so that he is unable to carry on a line of thought. Patients sometimes speak of the intrusion of thoughts which seem to them to be absurd and irritating, but which are later placidly accepted. During the early stages of this development, care must be taken to distinguish this symptom from the obsessional neurosis, as described below under differential diagnosis.

A second group of less frequent symptoms is comprised of various physical ailments. As a rule these refer either to a general feeling of weakness and easy fatigability, or to rather odd or persistent complaints in the absence of physical symptoms to substantiate them. In particular the heart, the stomach, the functions of excretion and the reproductive apparatus are singled out. As the illness progresses the complaints become more and more fixed and bizarre, so that a patient who has been concerned over alleged palpitation and weakness of his heart may declare that his heart has stopped entirely or has been transferred to the right side of his body. A final symptom, which is only infrequently found in early stages, is a sensation of unreality, the patient complains that he feels as though he were in a dream, that he does not feel normal, and that things around him, although well known to him, have lost the touch of familiarity. This symptom, when it does occur early, usually portends the rapid development of the disease.

DIFFERENTIAL DIAGNOSIS

Although the presence of any of the symptoms outlined should arouse suspicion, final diagnosis must be based on the detailed picture presented by the patient. In the early stages of schizophrenia care must be taken to distinguish it from conditions with which in its later development there would be no danger of confusion. Brain tumors, especially those located in the frontal lobes, may present a picture difficult to distinguish from that of early schizophrenia, save after an exhaustive neurological examination. Similarly, the late and gradual development of a postencephalic Parkinsonian syndrome may, during its first stages, imitate the symptoms of early schizophrenia. This syndrome is particularly confusing when it occurs in association with personality changes in adolescence. A detailed history will usually serve to bring to light

During the last several years one therapeutic method after another has been proposed, in each instance it has been emphasized that considerably better results have been obtained in early cases. The production of long-continued sleep, introduced by Klati⁵ and since modified by many workers, is reported by Favre⁶ to have little success in cases of long standing. Meduna,⁷ who recently brought out a method of treatment whereby convulsions were produced through the intravenous injection of metrazol, states that the first six months of the disease constitute by far the most favorable period, this is borne out by Friedman,⁸ who introduced the method in this country. Sakel,⁹ and the numerous workers who have used his treatment, consisting in the production of insulin hypoglycemia, have emphasized that there is a close relation between the duration of the illness and the outcome of the treatment. Good results are claimed when the cases are of less than six months' duration. The outlook is still hopeful when the duration is less than eighteen months, but thereafter the likelihood of a favorable outcome rapidly lessens. Dussik¹⁰ in a recent article even insists that delay within the first six months in itself renders the treatment more difficult and the outlook more dubious.

PRESENT STATUS OF SCHIZOPHRENIA ADMISSIONS

Those who are developing new methods of treatment in Massachusetts state hospitals generally agree that the great majority of patients who might have benefited come to the hospital in an advanced stage of illness. Hospital records have repeatedly shown that individuals have been clearly recognized as mentally sick even by laymen for years before hospital treatment was sought. From March, 1936, to February, 1937 (inclusive), 197 cases of schizophrenia were admitted to the Worcester State Hospital. Of these, 32.4 per cent had shown symptoms for six months or less, 17.5 per cent for between six months and two years, and 48.1 per cent for over two years. This delay in hospitalization is also clearly shown by the following figures, based on first admissions to the New York Civil State Hospital¹ in 1925:

AGE GROUP	AVERAGE DURATION OF SYMPTOMS BEFORE ADMISSION (YEARS)
15-19	7
20-24	1.5
25-29	1.7
30-34	2.0
35-39	2.7

The delay is partly due to the reluctance of families to have their members enter a state hospital, it is also partly due to the obstacles to early diagnosis, and to the difficulty experienced by the

general practitioner in obtaining a clear picture of the early symptomatology.

EARLY SYMPTOMS

Early symptoms vary to some extent with the age at which the disorder begins. In the younger age groups there are two fairly well-divided trends. One is the gradual development of schizophrenia in a person who has from childhood been an odd, aloof individual, or one who has shown many behavior problems, such as long-continued enuresis, temper tantrums, sulking and emotional instability. There is frequently a gradual accentuation of personality trends for years, the first recognition of the illness coming with the appearance of frank delusions. The second trend is the sudden appearance of odd, perhaps dramatic, behavior in a person who has been under recent stress. It may take many forms: stupor, or states of ecstasy, or suicidal attempts, or bizarre exhibitionism. Infantile traits, such as bed-wetting and refusal to eat unless actually fed, may appear. Usually accompanying this condition are considerable confusion and inability to concentrate. In the older age groups the onset is often more insidious. Four groups of early symptoms require special notice: withdrawal, loss of capacity, emotional dulling, and tendency toward misinterpretation.

Withdrawal. In this condition, the patient who may hitherto have enjoyed good social relations, both at home and in his work, gradually becomes less approachable. His family observe that he goes out less frequently, no new friends are made, and old acquaintances are gradually dropped. The patient appears to become dull, his social relations lose some of their warmth. Interests and hobbies claim his attention to a decreasing degree, and he spends a considerable part of his time in daydreaming. Occasionally the patient makes active efforts to secure solitude. Even less frequently he realizes that he is drifting away from contact with every day affairs, and tries hard to recover his old ability to be interested and to form friendships. Noyes¹¹ states that in the patient who is "usually poorly endowed in warmth and spontaneity there is a decrease both in desire and attempts to express the personality." Yellowlees¹² lays great stress upon withdrawal from reality, and believes that this symptom will be found in almost every adequately studied case of schizophrenia.

Loss of Capacity. Among the earlier symptoms is a gradual failure to deal with everyday tasks of work and living. This, too, may be recognized by the patient, and he may complain that he has lost the capacity to concentrate or that he has lost his former energy. More often his friends first comment upon it and refer to his having lost

SOCIAL SECURITY AND THE PHYSICIAN

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THE scope of the term "social security" is almost unlimited, hence, in considering the problem we should divorce our minds from the meager provisions of the Social Security Act approved August 14, 1935. The subject is much broader. President Roosevelt has summed it up well by saying, "Among our objectives I place the security of the men, women and children of the nation first." He has also said that security for the individual and for the family concerns itself with three factors: (1) decent homes to live in, (2) development of the natural resources of the country so as to afford the fullest opportunity to engage in productive work, and (3) safeguards against the major misfortunes.† My discussion, however, will be confined to those aspects of social security which impinge on the life and work of the physician.

Until today, this country has lagged far behind many others in social security legislation, but now that a beginning has been made we will, whether we wish to or not, be forced rapidly onward by reason of the ever-accelerating speed with which social rules are gathering headway in our democracy. From now on, the medical profession in all its contacts with the public will become increasingly aware of the new conditions brought about by social legislation, and be forced to adjust itself to them. We may wish with all our hearts that we could go back to the horse-and-buggy days, after all, those times had something to recommend them, but, as we have recently been so constantly reminded, those days are gone forever. We must either keep up with the march of time or be left jogging along behind. Far too many of us doctors go about our practice without realizing that while we are attending conscientiously to the task of the moment, grave issues of medical policy are every day pressing closer. In our medical journals, newspapers and magazines we read of the trend toward state medicine, the entrance of government into the care of tuberculosis, cancer, pneumonia, and so forth. But do we actively concern ourselves with the legislation, the setting up of commissions, the financing and the centers of control of these new governmental interests? We owe to ourselves, to our community, to the state and to the nation, an intelligent understanding of social security. Not only that, as doctors and as members of this medi-

cal society we should define in our minds our share in this field of medicine. For instance, it seems to be generally agreed that the bona-fide indigent should be cared for by some governmental agency. Should we not be ready to declare our stand on the methods to be employed? Should we not have a plan for improving the health of the nation by the extension of preventive medicine? Should we not formulate plans or at least a theory for financing the care of the indigent? In addition, should we not make recommendations as to where the control of this work should lie? These matters, it seems to me, are the vital concern of every one of us.

For centuries workers sought protection against sickness and its concomitant wage loss through the medieval guilds, the trade unions and a variety of mutual-aid societies. Before the industrial revolution many of the uncertainties and calamities of life were due to natural causes. With the coming of the machine age and the urbanization of populations, new uncertainties appeared, large classes of people who were without property and were earning small wages found themselves unable to meet many of the emergencies that arose. They banded together and pooled their resources, and many employers organized welfare and relief schemes.

Up to the last years of the nineteenth century, governments followed a hands-off policy. The states first encouraged mutual aid by authorizing welfare schemes and regulating contracts. The movement has in the last fifty years brought to birth thousands of mutual-aid institutions in many countries, with a total membership counted in the millions, yet in all this time only a small proportion of the working class has been enrolled. In particular those earning low wages did not join these societies, which despite their large numbers were individually quite small, they were also very unevenly distributed, being numerous in the cities and almost non-existent in rural areas.

In spite of its theoretical advantages, voluntary insurance was not sufficient, compulsory insurance was the next step taken to provide wider aid and better protection. Germany in 1883 under Bismarck, without any effective experimentation with the voluntary method, was the first to make insurance compulsory for industrial workers, in 1885 the scheme was extended to commerce and in 1886 to agriculture, so that from 40 to 45 per cent of the population of Germany is now covered by

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*President's Messages, June 8, 1934, and January 4, 1935.

the earlier acute illness. Other organic conditions which require consideration are epilepsy, where the attacks are light and unobserved and the changes in personality well developed, drug addiction, especially alcoholism, and the toxic states. In general the symptoms peculiar to these conditions will serve as counterpoises in the observer's judgment against those also exhibited in early schizophrenia. Mayer-Gross,¹⁴ in considering the differential diagnosis of schizophrenia and the organic affections of the central nervous system, lays stress first on the physical symptoms which accompany the latter, secondly on the fact that, while in this group the intelligence and memory are usually more affected than are the quality of emotional responses and the ability to establish emotional rapport, in the schizophrenic the reverse is the rule.

Among the mental conditions, the disorder which is most likely to cause confusion is manic-depressive psychosis. Henderson and Gillespie¹⁵ point out that the apathy, the listlessness, and in fully developed cases, the stupor of schizophrenia may be confused with those manifested by depression. They emphasize that, as even brief inquiry usually reveals, the listless schizophrenic has no feeling of sadness, but is often contented and desires only to be let alone. Certain psychoneuroses, particularly obsessional neurosis, and to a lesser extent hysteria, present some difficulties, the former because of the occurrence of intrusive thoughts which the patient cannot control, and the latter because of the occasional inadequate emotional responses and of the trance-like states which may cause confusion with the true catatonic stupor. The diagnosis must be made on the detailed picture presented by the early symptoms, with no one of them overstressed.

SUMMARY

The social and economic significance of schizophrenia has been demonstrated. Although the illness is one with a relatively low incidence it has great chronicity, so that ultimately more hospital beds are occupied by schizophrenic patients than

by patients suffering from any other mental illness. The financial burden which this disease imposes is heavy. A significant feature is that the average patient is brought to the hospital relatively late in his illness. In many cases, when hospital treatment is begun, symptoms have been present for years. Hospital treatment has in the past offered little more hope for early cases than has care in the home. Recently, however, various forms of treatment have been brought forward, their originators and proponents emphasizing that they are much more effective in the early stages. The value of these methods has not yet been fully assessed. These conditions, and the general experience of physicians that the earlier in the disease treatment is begun, the better chance it has of proving effective, lead inevitably, however, to one conclusion—every effort must be made to promote earlier hospitalization. Since this responsibility rests chiefly on the general practitioner, we have endeavored to give a description of the earliest symptoms of which we have knowledge.

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The success of this general program depends on the wisdom shown in developing well-balanced plans and in securing the co-operation of the many groups interested. At present there is great difficulty in finding persons well qualified to do the work. Thorough training in pediatrics, obstetrics and orthopedics is necessary, as well as a knowledge of public-health problems and procedures. Many recent medical graduates are looking forward to work in the field of public health and are taking postgraduate courses to fit themselves for it. Both the Children's Bureau and the United States Public Health Service are making an earnest endeavor to pick men who will maintain high standards and who have adequate medical background, even though they lack specific public-health training. The Social Security Act has been rushed through with such speed that time will necessarily be needed to train the proper personnel.

A letter of April 6, 1937, from the Children's Bureau, says "To date forty-eight states, Alaska, Hawaii and the District of Columbia have approved plans for maternal and child-health services, forty-two states, Alaska, Hawaii and the District of Columbia have approved plans for services for crippled children, and forty-two states and the District of Columbia have approved plans for child-welfare services." The Public Health Service states in a letter dated April 7, 1937 "All the states, the territories of Alaska and Hawaii and the District of Columbia are participating in the program,"—that is, the grants under the public-health-service section of the Social Security Act.

What part is Massachusetts taking in the functioning of the act? Maternal and child-health service is under the direction and control of the Division of Child Hygiene, and the crippled-children service is directed by the Orthopedic Unit of the Division of Administration, both of which are subdivisions of the State Department of Public Health. The child-welfare program comes under the State Department of Public Welfare.

Our crippled children in Massachusetts have been benefited to the extent of \$85,000 received during the last year. Such a child is defined as "one who is under twenty-one years of age, who is suffering from poliomyelitis, bone or joint tuberculosis, congenital defects (harelip or cardiac disease), arthritis and other similar conditions that may lead to or have produced crippling and that may be treated advantageously." Eleven clinics have been established under the act—in Pittsfield, Greenfield and Springfield in western Massachusetts, in Worcester and Gardner in the central part, in Haverhill,

Lowell and Salem in the northeastern area, and in Fall River, Hyannis and Brockton in the south east. There are no clinics in the Metropolitan area. Each is in charge of an orthopedic surgeon, who gives his services for a nominal fee. The first clinic was opened in Pittsfield September 2, 1936. Through January 15, 1937, thirty-two sessions had been held, 244 children had made 298 visits, 40 had entered hospitals and 750 treatments had been given by the field physiotherapists. The patients must be recommended by their family physicians. Applications are passed upon by a committee from the local district medical society, and when approved, must be finally accepted by the orthopedist in charge of the clinic. This procedure has been approved by the Massachusetts Medical Society. Fortunately these various clinics are in charge of well-known, high-grade orthopedic surgeons.

At Worcester five or six clinic sessions have been held, the patients were all from out of town and almost entirely chronic cases or those requiring free service. I am told by the surgeon-in-charge that this work has proved well worth while. He also states that there has been little or no encroachment on private professional work. Such infringement is an obvious possibility, but with proper control of the clinics this danger is slight. This type of advance by government into medicine has been helpful rather than hampering and has met with general approval and co-operation from lay women, many of whom are giving both time and money. Through the active assistance of the medical profession such governmental activity should prove a mutually beneficial function in socializing the practice of medicine.

The other funds received by Massachusetts under the Social Security Act are used to extend the former health program, with the addition of a number of special projects—the care of premature babies, health surveys, improvement of school lunches, parent education, and research, study and community demonstrations in nutrition and public health nursing. There is some hope that under the public-health section of the act money to extend medical education through clinics and lectures to physicians in various parts of the State will be forthcoming.

What is the future of social security? You have all received a communication from the Committee on Public Relations of the Massachusetts Medical Society, dated February 1, 1937, telling you of approaching legislation on compulsory health insurance in Congress and in our own legislature. Any such legislation is bound to affect all doctors, the issue is one between social science and medical science, the latter is fighting a lone battle, while

social science is backed by many economists, almost all social workers, and the public. Many politicians see in this broad humanitarian issue much chance for patronage and votes.

Are we in for state medicine? It is hard to see any other deduction if compulsory health insurance goes through, for under such a regime the doctor would be under direct control of those who hold the purse strings. Consider the trend of government responsibility in the care of the sick: first it was limited to the insane, next it included those with tuberculosis. Now Massachusetts takes upon itself a large responsibility in dealing with cancer, while New York does the same with pneumonia. Arthritis, cardiac diseases and rheumatism are all engaging considerable public interest. No doctor wants to care for the insane. Terminal cancer cases require so much attention that most Massachusetts doctors are glad to send them to the (politically built) Pondville Hospital, now so crowded that a second one is to be built in the western section of the State. New York has just appropriated \$400,000 to type and furnish free serum for pneumonia, which will help not only the public but the medical profession. Our many veterans' hospitals are an ever present threat that many other diseases may be given government supervision as these hospitals become less occupied by the ex-soldiers.

There is much to be learned from the experience of European countries. As already pointed out, the Workmen's Compensation Act was foisted upon the medical profession, and is only now working more smoothly because there is medical representation on the various administrative boards. Health insurance in England was established without the medical profession's having anything to say, and only recently has it had any worth-while representation on supervisory bodies. It is only fair to add, however, that recently the British Medical Society has asked to have the system extended to those with higher incomes. In Germany and many other countries the doctor has nothing to say about the regulations governing this vital medical problem. It therefore behooves the medical profession to make an exhaustive study of it. We cannot stage a sit-down strike, we must take some action other than mere negative opposition. We cannot fight this movement destructively, but must make counter proposals.

Most leading medical scientists agree with the social scientist that modern medicine is not available to the great majority of the population. It is here that we must co-operate with the social scientists. The latter interpret the problem solely as one of paying out enough money to get the necessary results, while doctors know that many people

continue to prefer patent medicines and employ quacks and cultists, we also know that there is not yet enough first-class medical care to distribute, even were it possible. The profession should realize that this is one of its main weaknesses. Until the medical schools meet this challenge, regimentation by the state will only make matters worse, for before the law competent and incompetent doctors are alike. Improvement in medical education and an increase in professional ability will naturally take a long time, so that we cannot count upon them in our present scheme. We must make some compromise with the social scientist and socialize certain medical services rather than socialize the doctor.

We must stress preventive medicine, that is, we must plan more for health than for better care for the ill. Our health policy must be national in scope, as are policies of defense and education, so that privileged and underprivileged alike will benefit, we must think in terms of the health of the entire population rather than of the illness of one part. The medical problem is only a small phase of the economic problem of low wage-earners, who form 80 per cent of the population, our attack must be on a broader front. Recent studies undertaken so as to discover the inadequacies of our present medical system show that they are more dependent upon poverty, unemployment, intemperance, superstition and inertia than upon a scarcity of doctors, hospitals or free clinics.

In order to carry out such a program we must have leadership from the federal government. If the doctor as well as the social scientist is called into consultation, we can present concrete suggestions dealing with the health of the population as a whole rather than with the illnesses of a relative few.

After thoughtful study of this subject, I wish to make the following recommendations:

1 *Preventive Medicine* We need to emphasize prevention of disease by the marked expansion of public-health services. None of the countries where compulsory insurance is in force can show any reduction in mortality, and many countries, notably Germany and England, show a marked increase. The present venereal-disease program, stimulated by the United States Public Health Service, is a noteworthy attempt to deal early with a disease which may later cause dependency and penury. By socializing such kinds of medical service we can improve the general health.

2 *Local Tax Support for Hospitals* We cannot continue to depend upon private philanthropy to support the hospitals caring for the indigent or low-income group. This cost should be met from local

tax funds, if possible, with state and federal aid under certain conditions and in certain communities. This may mean increasing the courtesy staff at many hospitals, but Class A medical schools now graduate students who must have a hospital connection in order to do their best work, and by selecting the right men we could improve the standard of medicine in our cities. However, if we accept federal aid for our hospitals, we cannot refuse to pay federal taxes to care for maternity cases in Oklahoma or any other state.

3 *Local Tax Support for Laboratories* A great many people go to the hospital to get additional laboratory data and x-ray diagnoses. The personnel and facilities needed to do this work could be put in charge of the Massachusetts Medical Society, thus preventing political corruption, commercialism and favoritism from governing appointments. The establishment of additional laboratories, especially in the rural districts, would give definite help to those living there. They would help the doctor to practice better medicine, reduce hospital care and increase the efficiency of domiciliary service. These stations could be supported by local tax funds or by state or federal grants-in-aid, which might come under the scope of the present Social Security Act.

4 *Local Tax Support for Medical Care of the Indigent and Near-Indigent* Such care should be financed by local taxation so far as possible, with state and federal aid under certain conditions and in certain communities. It has been a tradition in our profession to give poor people adequate medical care, irrespective of their ability to pay. This may be far from "adequate," a word about which we hear so much from the social scientist. "Adequate" care in one case may mean giving bread and milk, in another it may call for the most painstaking, detailed study. Most of the public have no conception of the amount of free care given to the indigent in hospitals, where everyone except the doctor and pupil nurse is paid, in outpatient de-

partments, where many young doctors put in generous parts of their days without any thought of financial reward, and even in doctors' offices and patients' homes. The present Social Security Act, and most other compulsory insurance acts, do not reach this class of people. The help we give them is traditionally unorganized and hit-or-miss, if poor patients were to receive more organized and definite aid much could be done to benefit them.

5 *Establishment of a Federal Co-ordinating Authority* At present some health work is under the guidance of the United States Public Health Service, a branch of the Treasury Department, and some is under the Children's Bureau of the Department of Labor. Instead, it should be centered in a Department of Health, with a medical Secretary of Health, who would be a cabinet officer. We could then attack these problems along broad lines, with good assurance of being able to raise the standard of medical practice and thereby improve public health.

In presenting these plans we must recognize the rapidly changing nature of medical science and avoid any standardization of mediocrity. With federal funds the standards of medical education can be raised and the results of medical research can be made available to many more people. If such steps as I have suggested are not taken by the medical profession itself, we shall find ourselves confronted by a *fait accompli*, having had no voice in the matter and with only ourselves to blame for the result. This is no time for a *laissez faire* attitude. We must overcome our lethargy, educate ourselves as to what should be done, and follow through with united front to bring about such legislation as will be fair to both the practitioner and the public.

21 West Street.

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CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITALANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24051

PRESENTATION OF CASE

A forty-five-year-old Canadian born farmer entered the hospital with the complaint of pain in the right lower quadrant of a month's duration.

He had always been in good health up to a month before entry, when he first had a feeling of "gas" in the lower part of his abdomen. Three weeks before entry he could feel a firm, somewhat tender lump, measuring about 5 cm. in diameter, in his right lower quadrant. He also had dull non-radiating pain in his right lower quadrant which at first was so mild that he forgot about it when he was busy. The pain came on in attacks which occurred daily and lasted from a few minutes to several hours. It bore no relation to urination, defecation or the eating of food, but was relieved by gaseous eructations and the passage of gas by rectum. The attacks of pain became slightly more severe during the two weeks before entry but never caused him very much distress. The tender lump in the right lower quadrant did not increase in size. He did not have bloody or tarry stools, diarrhea, nausea, vomiting, loss of appetite, loss of weight, or any other significant symptoms. During his illness he frequently took milk of magnesia and occasionally other cathartics for relief of the pain. This apparently had the effect of increasing his bowel movements from one to two per day.

His past history and family history were noncontributory.

Physical examination revealed a well-developed, poorly nourished man who was not acutely ill. His trachea appeared to be slightly deviated to the left and there was slight dullness and decreased tactile fremitus without rales at the apex of the left lung. His heart was negative, and his blood pressure was 130 systolic, 90 diastolic. In the right lower quadrant there was a firm, irregular mass measuring about 7 cm. in diameter which appeared to be fixed to the region of the brim of the pelvis. It was tender on its medial aspect. There was no other abdominal tenderness, spasm or rebound tenderness. The liver could be palpated three finger-breadths below the costal margin, and its surface was smooth and non-tender.

The temperature was 98.6°F., the pulse 78. The respirations were 18.

The urine examination was negative. The blood showed a red-cell count of 4,900,000 with 70 per cent hemoglobin. The white-cell count was 8400 with 71 per cent polymorphonuclears. The blood Hinton test was negative.

A barium enema passed freely up to the cecum, where there was a constant filling defect involving the lower part of the cecum. There was a suggestion of slight irregularity of the mucosa of the cecum, and the appearance of this filling defect was that of intussusception. A very small amount of barium passed into the terminal ileum. A gastrointestinal x-ray examination by a motor meal showed a mass measuring about 5 cm. in diameter, involving the pole of the cecum. Overlying the mass there appeared to be transverse mucosal lines in the cecum having the appearance of intussusception. The terminal ileum for about 6 cm. from the ileocecal valve was narrowed and showed normal mucosa and peristalsis with no evidence of intrinsic disease. However, it was displaced upward by the mass in the cecum, and above it the ileum was somewhat dilated. In the region of the mass there was a small area of calcification measuring about 1 cm. in diameter.

On the sixth day a laparotomy was performed.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON: We have a barium enema examination and a double contrast enema. Here is the mass that is described. In this picture you can see the defect in the cecum with the transverse folds of mucosa which look like intussusception. In all these pictures there is an area of calcification about the size and shape of the appendix and about 1.5 cm. in length. The calcification is in the center of the mass. The ileum is normal except for displacement. The chest is normal.

DR. ARTHUR W. ALLEN: Did they get the information that his trachea was drawn over to the left from the x-ray or from physical examination? Apparently they thought there was an old apical lesion on the left.

DR. HAMPTON: His trachea is in the midline on the film. He has some indefinite density in the first right interspace, but I do not see anything on the left side.

DR. ALLEN: Does the x-ray department make a definite diagnosis of intussusception in this case?

DR. HAMPTON: The tip of the cecum appears slightly infolded. The condition has not progressed to the point of intussusception of the ileocecal valve, rather just a little pushing in of the cecum, let us say. But even so this could be the beginning of intussusception. I do not know whether one could tell whether the tip of the cecum was pushed up or drawn in.

DR ALLEN Where is the 6 cm of ileum that was narrowed? Can you point that region out?

DR HAMPTON It is not very narrow. There are normal mucosal folds through it. It is displaced rather than actually narrowed.

DR ALLEN Does this represent the hepatic flexure?

DR HAMPTON Yes, very low.

DIFFERENTIAL DIAGNOSIS

DR ALLEN There is so much said about intussusception in this case that we may infer that that is not what he has. The matter with him. But it is a very interesting story which brings up a good many points of interest in differential diagnosis, and I think we must accept the history as it is given.

This man did not come down with any acute illness at the time of onset of discomfort. According to the history his pain was low abdominal pain from the beginning and was that of large-bowel disease. I think there are various possibilities that one might consider. In the first place we start with a palpable tumor in the right lower quadrant. The patient himself discovered this tumor and undoubtedly it excited his curiosity. There was some tenderness in the tumor to palpation, particularly on its medial aspect, but the size of the tumor apparently had not varied much from the time he first noticed it until admission to the hospital. The question of an old apical tuberculosis which has been brought out in the history would make one think of the possibility of tuberculosis in the region of his cecum to account for the filling defect and the tumor. On the other hand I think it would be unlikely for a man to have tuberculosis of the cecum to the point of a palpable mass without having had a longer story of malaise and fatigue and inability to work. His malnutrition may not have been a real one, although it is possible that he had limited his diet somewhat due to resulting discomfort, in spite of the fact that the story says otherwise.

If we are going to consider all the possibilities that might cause a tumefaction with intussusception in the region of the cecum, we of course think of various benign lesions, because most of the intussusceptions of the right side of the bowel are started by benign tumors of some sort, usually not in the lumen of the bowel but in the wall. A lipoma may form in the bowel wall and be the starting point of an intussusception. A lymph-node enlargement in the ileocecal mesentery may start such a lesion. A benign polyp is not an infrequent cause for intussusception in the bowel. And then of course we have the various malignant neoplasms. It is perfectly true that a man may have a consid-

erable lesion in the cecum or ascending colon from which he has no symptoms until it intussuscepts, but when intussusception takes place he is apt to have complete obstruction, he comes in as a case of intestinal obstruction with a palpable tumor on the right side, and not until the intussusception is dislodged by a barium enema or by spontaneous reduction does the relief of temporary obstruction occur, and with this, relief of pain. The fact that this man had had only intermittent pain which was probably cramp-like in character, although it does not say so, means that he was not obstructed. Besides, his bowels moved twice each day with a little milk of magnesia, that, I believe, is the biggest argument against its being intussusception.

If we want to assume that it was not intussusception and argue from that standpoint, what are the causes of masses developing in the right lower quadrant? Of course the commonest cause is appendicitis. The onset of this story is very unlike appendicitis, but we all know that appendicitis may produce any form of abdominal pain and present the widest variations of symptomatology. He had had this difficulty for four weeks, so we may not be too perturbed by the fact that his white count was normal. One might also take into consideration the tenderness of the mass. It does not state whether the skin over it was red. Perhaps it was. It still could be a subacute or very small, low-grade appendix abscess which was well encapsulated and which could be palpated. It might have buried itself into the cecum in such a way as to account for this picture.

The calcification in the center of the mass makes one suspicious of tuberculosis. One can have a low grade tuberculous process in the ileocecal region involving primarily the lymph nodes, in which calcification can take place, and perhaps there could be associated with that a superimposed acute or subacute inflammatory process, which in other nodes might go on to small-abscess formation and still have a calcified node nearby.

I think that this is not cancer, although I am not influenced by the fact that he has so little anemia. Many of the right colon lesions are picked up early enough so that they have not caused anemia. I doubt if it is one of the bizarre diseases like leukemia, amebiasis or actinomycosis. I think it is a benign lesion, not cancer, and the choice lies between tuberculosis and an unusual form of appendix abscess. I should be inclined to say that because of lack of obstruction he did not have intussusception and that his tumefaction was due to some subacute inflammatory process. I should put as my first choice a tuberculous node with calcification and secondary infection of other nodes, and as second choice, some form of appendicitis.

CLINICAL DISCUSSION

DR. RICHARD H. SWEET: I operated on this patient, and we came to exactly the same conclusion before operation that Dr. Allen has reached. We felt that he had an inflammatory process, not a carcinomatous cecum. My preoperative diagnosis was tuberculosis of the cecum. This mass was not tender, but was exceedingly firm and fixed. It felt like carcinoma, but when we opened the abdomen it was obvious that it was a chronic inflammatory lesion. The appendix was not visible except when the ileum was rolled over. It was somewhat adherent in the region of the mass, and one could see about 10 cm. of the dilated tip. The end of the cecum and the appendix region were involved in this inflammatory mass. There were a number, almost a handful, of immensely swollen lymph nodes in the mesentery in that region. It was impossible to free the mass from the underlying peritoneum. We did not know exactly what we were dealing with. We still felt that it was tuberculosis and proceeded with a right colectomy on that basis.

DR. WILLIAM B. BREED: I should like to ask Dr. Hampton if he could say definitely that this small area of increased density is not an area of calcification and that it is not an appendix with barium in it.

DR. HAMPTON: When we first saw the area we thought it was barium, but it remains in all the films and does not have so much density as barium. It does not look like a tuberculous gland. It has the shape of the appendix, and the only thing that you can really attribute it to is a calcified fecalith in the appendix. I saw the film before I knew what happened to the patient and asked the examiner to write in his note that the process was a benign tumor of the appendix, I could not imagine anything else that would produce this picture.

DR. ALLEN: You cannot see this mass in any shape or form similar to a calcified gland?

DR. HAMPTON: No. I am sorry that I did not go into that more before you discussed it. It does not look like any type of calcification that one ordinarily sees.

CLINICAL DIAGNOSIS

Tuberculosis of the cecum

DR. ALLEN'S DIAGNOSES

1. Tuberculosis of the cecum without intussusception
2. Subacute appendix abscess

ANATOMIC DIAGNOSES

Subacute and chronic appendicitis without abscess.
Fecalith

PATHOLOGICAL DISCUSSION

DR. BENJAMIN CASTLEMAN: The specimen that we received consisted of a portion of the ascending colon, the cecum, the appendix and a segment of terminal ileum. The appendix was at first scarcely recognizable since it was somewhat over 2.5 cm. in diameter and was almost buried in the wall of the cecum lying beneath the serosa of the latter. Its gross aspect was therefore most suggestive of a tumor. After a plane of cleavage had been found and it was dissected free, it was evident that the appendix was about 7 cm. in length, its walls averaged a centimeter in thickness and its lumen was patent but contained a fecalith, which was proved to be opaque to x-rays.

Microscopic examination showed no evidence of neoplasm, of tuberculosis or of any specific inflammatory lesion. There was a marked infiltration of all layers of the wall with lymphocytes, plasma cells and a very rare eosinophil. There was some inflammatory edema but most of the thickening appeared to be due to fibroblastic proliferation. The regional lymph nodes, which were numerous and large, showed only an inflammatory hyperplasia.

This is one of the very few appendices we have ever seen in this laboratory which, in the opinion of all the staff, unquestionably warranted the diagnosis of chronic appendicitis. That there was at the time of removal, and had been for at least a month previously, progressive infection and inflammatory reaction seems certain from the microscopic picture. Cases of this sort, however, are far too rare to give any encouragement to the surgeon who still tries to rationalize himself into believing that chronic appendicitis is a justifiable clinical diagnosis.

CASE 24052

PRESENTATION OF CASE

First Admission A thirty-year-old white, male, Irish chauffeur entered the hospital for the first time with the complaint of pain in the left knee of two years' duration.

About two years before entry he noticed the onset of pain in the left knee. It was sharp and knifelike and came on in attacks lasting one or two days. During inclement weather the attacks lasted longer. These attacks gradually became more severe but the pain never spread beyond the knee. About two months before entry he consulted a physician who advised Epsom-salt stupes. These seemed to increase the severity of the pain. One month before entry x-ray studies were made, and an apparent abscess over the upper third of the left tibia was incised and drained. The material obtained was submitted to a patholo-

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DR HAMPTON It is not very narrow. There are normal mucosal folds through it. It is displaced rather than actually narrowed.

DR ALLEN Does this represent the hepatic flexure?

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DIFFERENTIAL DIAGNOSIS

DR ALLEN There is so much said about intussusception in this case that we may infer that that is not what he has. The matter with him. But it is a very interesting story which brings up a good many points of interest in differential diagnosis, and I think we must accept the history as it is given.

This man did not come down with any acute illness at the time of onset of discomfort. According to the history his pain was low abdominal pain from the beginning and was that of large-bowel disease. I think there are various possibilities that one might consider. In the first place we start with a palpable tumor in the right lower quadrant. The patient himself discovered this tumor and undoubtedly it excited his curiosity. There was some tenderness in the tumor to palpation, particularly on its medial aspect, but the size of the tumor apparently had not varied much from the time he first noticed it until admission to the hospital. The question of an old apical tuberculosis which has been brought out in the history would make one think of the possibility of tuberculosis in the region of his cecum to account for the filling defect and the tumor. On the other hand I think it would be unlikely for a man to have tuberculosis of the cecum to the point of a palpable mass without having had a longer story of malaise and fatigue and inability to work. His malnutrition may not have been a real one, although it is possible that he had limited his diet somewhat due to resulting discomfort, in spite of the fact that the story says otherwise.

If we are going to consider all the possibilities that might cause a tumefaction with intussusception in the region of the cecum, we of course think of various benign lesions, because most of the intussusceptions of the right side of the bowel are started by benign tumors of some sort, usually not in the lumen of the bowel but in the wall. A lipoma may form in the bowel wall and be the starting point of an intussusception. A lymph-node enlargement in the ileocecal mesentery may start such a lesion. A benign polyp is not an infrequent cause for intussusception in the bowel. And then of course we have the various malignant neoplasms. It is perfectly true that a man may have a consid-

erable lesion in the cecum or ascending colon from which he has no symptoms until it intussuscepts, but when intussusception takes place he is apt to have complete obstruction, he comes in as a case of intestinal obstruction with a palpable tumor on the right side, and not until the intussusception is dislodged by a barium enema or by spontaneous reduction does the relief of temporary obstruction occur, and with this, relief of pain. The fact that this man had had only intermittent pain which was probably cramp-like in character, although it does not say so, means that he was not obstructed. Besides, his bowels moved twice each day with a little milk of magnesia, that, I believe, is the big-
gest argument against its being intussusception.

If we want to assume that it was not intussusception and argue from that standpoint, what are the causes of masses developing in the right lower quadrant? Of course the commonest cause is appendicitis. The onset of this story is very unlike appendicitis, but we all know that appendicitis may produce any form of abdominal pain and present the widest variations of symptomatology. He had had this difficulty for four weeks, so we may not be too perturbed by the fact that his white count was normal. One might also take into consideration the tenderness of the mass. It does not state whether the skin over it was red. Perhaps it was. It still could be a subacute or very small, low grade appendix abscess which was well encapsulated and which could be palpated. It might have buried itself into the cecum in such a way as to account for this picture.

The calcification in the center of the mass makes one suspicious of tuberculosis. One can have a low grade tuberculous process in the ileocecal region involving primarily the lymph nodes, in which calcification can take place, and perhaps there could be associated with that a superimposed acute or subacute inflammatory process, which in other nodes might go on to small-abscess formation and still have a calcified node nearby.

I think that this is not cancer, although I am not influenced by the fact that he has so little anemia. Many of the right-colon lesions are picked up early enough so that they have not caused anemia. I doubt if it is one of the bizarre diseases like leukemia, amebiasis or actinomycosis. I think it is a benign lesion, not cancer, and the choice lies between tuberculosis and an unusual form of appendix abscess. I should be inclined to say that because of lack of obstruction he did not have intussusception and that his tumefaction was due to some subacute inflammatory process. I should put as my first choice a tuberculous node with calcification and secondary infection of other nodes, and as second choice, some form of appendicitis.

osteal elevation along the borders of the shaft X-rays of the chest and long bones were negative
On the sixth day an operation was performed

DIFFERENTIAL DIAGNOSIS

DR. GRANTLEY W. TAYLOR Since this is obviously a bone problem I think we had better look at the X-rays before we start the discussion

DR. GEORGE W. HOLMES In the first film we see a lesion which involves the upper two thirds of the tibia. It apparently stops sharply at the joint surface. There is destruction of the cortex but not complete destruction. It seems to be infiltrated but not completely destroyed, and there is a moderate amount of periosteal reaction. In this film I see no definite soft-tissue tumor. A primary osteogenic tumor of bone with involvement to that extent would certainly be accompanied by soft-tissue tumor. Occasionally a Ewing's tumor, a reticulum-cell sarcoma or some other lymphomatous type of tumor, or, of course, metastatic tumor will present this picture. Even after the process had gone on for a considerable time and had been operated upon there was no involvement of the joint. Osteomyelitis does not always involve the joint, but a lesion with this duration and with this extent of bone involvement should, I think, involve the joint.

In this film you see a considerable soft-tissue shadow which is somewhat lobulated distinctly more so than you would expect in an ordinary case of osteomyelitis. This process is too evenly distributed and the mottling too coarse for osteomyelitis. Furthermore, there is more involvement of the cortex and less of the periosteum than you would expect with chronic osteomyelitis.

DR. TAYLOR Dr. Holmes's remarks are very much more to the point than mine would have been in indicating that this is not a simple case of osteomyelitis. We have positive cultures, we have positive pathological examinations, we have a typical, clinical course, all of which indicate that the diagnosis of osteomyelitis was a logical one to account for at least part of the picture. There are several things that arise in the course of a review of the case which argue that it is not a simple osteomyelitis. First of all there is the fact that this patient began to have symptoms after he was twenty-eight years old and then of a rather mild degree with gradually increasing severity. Such a history is consistent with a Brodie-abscess type of osteomyelitis, which is not at all confirmed by the X-ray studies. This diffuse involvement of the upper end of the shaft is much more consistent with the type of osteomyelitis that sets in in young children before the epiphyses have united.

A similar picture may obtain in the early stages of the infection. His chart and clinical picture at the time of entrance to the hospital did not warrant a diagnosis of osteomyelitis of the sort that is consistent with these X-ray findings. The patient was in fairly good condition, his pulse was not particularly elevated, his temperature was not markedly elevated, he had occasionally increased white counts. So we realize that he must have had an accompanying infection along with his primary lesion, whatever that was. As I have said, he also had a tumor, and the problem is to decide what sort of tumor.

Dr. Holmes has alluded to a few of the tumors which we ought to consider in a case of this sort. Osteogenic sarcoma accounts for the largest proportion of the primary bone tumors. Ewing's tumor is commoner in younger people. The lymphomatous tumors must also be considered. I have not mentioned any benign tumors. There is nothing about this picture which suggests the possibility of benign tumor. Dr. Codman shed light on this case the other day—not discussing this case, however. He said that only one bone may be involved in the early stage of Paget's disease but that the disease does not persist as a one bone disease. If it does, then there is something wrong with the diagnosis. This patient came to the hospital before we routinely did blood-calcium studies and phosphatase determinations, so we do not have these findings to help or confuse the diagnosis.

The problem is, Which of the possible tumors are we dealing with? We have a process with destruction of bone, and a process with the formation of a good deal of new bone. We have something which looks almost like a pathologic fracture and which may have brought about the exacerbation of symptoms that brought him to the hospital. The rather rapid progress of this disease is of interest, namely, at the last admission he looked emaciated, whereas on the first admission two months previously, he was a well-nourished and fairly healthy individual. The progress of the tumor itself is astonishingly rapid so far as the process in the soft tissue is concerned and in the bone. With both Dr. Simmons and Dr. Codman present, I do not feel that I should venture to offer the last word on the diagnosis of bone tumors, but it is my impression that we are dealing with osteogenic sarcoma regardless of the fact that the X-ray picture is not typical. I should say that on the sixth day the tumor was explored for an adequate specimen for the pathological department and that amputation was carried out. I should also say that almost regardless of the nature of the tumor the prognosis was fairly poor.

gist who reported it to show a staphylococcal osteomyelitis. The wound closed in two weeks, but one week later was reopened by the physician, it had drained continuously during the week before entry.

His past history and family history were non-contributory. He denied ever having had venereal disease.

Physical examination revealed a well-developed, fairly well-nourished male in no distress. The physical examination was negative except for the left leg, which showed a discharging sinus about 2.5 cm in length in an operative incision over the upper aspect of the tibia. The area around it was swollen and slightly tender. The knee was held in 30° flexion. Extension and flexion were possible but painful, and there were spasm and atrophy of the thigh muscles.

The temperature was 98°F, the pulse 90. The respirations were 20.

The urine examination was negative. The blood showed a hemoglobin of 70 per cent and a white-cell count varying between 11,000 and 18,000. The blood Hinton was reported negative three times.

An x-ray of the left tibia showed the upper third to have a mottled appearance due to numerous areas of increased density and irregular areas of decreased density. The cortex had a moth-eaten appearance, and there was a considerable amount of new-bone formation about the upper shaft. The changes were quite diffuse, extending from the cartilage surface downward and fading out in the mid-shaft. There was very little increase in the size of the bone. The changes appeared to involve both the medulla and the cortex. An x-ray of the chest was negative.

His chart remained flat, and on the ninth day the lesion was widely incised and packed with iodoform gauze. There was a collection of pus on the anterior surface of the tibia. The bone itself was very dense and stony hard, and the periosteum and superficial cortex were destroyed. Some of the necrotic bone was gouged out. Biopsies were taken which, on pathological examination, showed acute and chronic osteomyelitis. Cultures of the material showed staphylococci in the broth, but no growth on a blood-agar plate. He was discharged on the thirtieth day with his wound still draining.

Second Admission (one week later). During the interval, wet dressings were applied to his wound daily by the district nurse. On the day before re-entry a painful, red, hot swelling appeared just above the wound and increased rapidly in size.

Physical examination revealed the infrapatellar bursa to be red, tender, swollen and fluctuant. There was no lymphangitis or swollen nodes. The operative wound was open and necrotic bone could be seen at its base.

The temperature was 103°F, the pulse 95. The respirations were 28.

The urine examination was negative. The blood showed a white-cell count of 18,500.

On the day of entry the fluctuant area was incised, and a large pocket of pus was found which extended across the entire anterior surface of the tibia just above the upper end of the previous incision. The abscess was packed with iodoform gauze. Culture of the material showed no growth on a blood-agar plate. On the second day the temperature dropped to normal and remained there until discharge. An x-ray on the seventh day showed a large operative defect involving the shaft of the tibia. The amount of bone destruction had apparently increased somewhat. He was discharged on the ninth day.

Final Admission (two months later). For three weeks after discharge he was in good health and thought that his lesion was healing properly. However, at the end of that time, five weeks before re-entry, he began to have very severe pain in his left knee which at first occurred only at night and awakened him from his sleep. Often the pain radiated deep to the inner side of the thigh or down the lower leg to his foot where it was needle-like in character. About two weeks before re-entry the pain had become almost constant, both day and night. At that time he noticed a swelling over the patella which gradually extended around into the popliteal space. It was very hot, red and tender to deep pressure. The swelling around his operative wounds also increased in extent. The wounds had continued to drain pus ever since his last operation. His general health was good except for occasional toothaches. He had no fever or night sweats.

Physical examination showed a somewhat emaciated man. The left knee was very much swollen and held in 30° flexion. There was a large swelling below the left knee with a deep fissure in it, lined by apparent granulation tissue. The skin over the swelling did not seem inflamed. A movable, non-tender node measuring 2.5 by 2 cm was palpable in the left groin.

The temperature was 99°F, the pulse 140. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,200,000 with 80 per cent hemoglobin and a white-cell count of 14,000 with 64 per cent polymorphonuclears. The blood Hinton was again negative.

An x-ray of the leg showed a large, lobulated, soft-tissue mass surrounding the upper portion of the tibia and the knee joint. The operative defect was less sharply defined and appeared to be partially filled in by new bone. There was some peri-

osteal elevation along the borders of the shaft. X-rays of the chest and long bones were negative.

On the sixth day an operation was performed.

DIFFERENTIAL DIAGNOSIS

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In this film you see a considerable soft-tissue shadow which is somewhat lobulated distinctly more so than you would expect in an ordinary case of osteomyelitis. This process is too evenly distributed and the mottling too coarse for osteomyelitis. Furthermore, there is more involvement of the cortex and less of the periosteum than you would expect with chronic osteomyelitis.

DR. TAYLOR: Dr. Holmes's remarks are very much more to the point than mine would have been in indicating that this is not a simple case of osteomyelitis. We have positive cultures, we have positive pathological examinations, we have a typical, clinical course, all of which indicate that the diagnosis of osteomyelitis was a logical one to account for at least part of the picture. There are several things that arise in the course of a review of the case which argue that it is not a simple osteomyelitis. First of all there is the fact that this patient began to have symptoms after he was twenty-eight years old and then of a rather mild degree with gradually increasing severity. Such a history is consistent with a Brodie-abscess type of osteomyelitis, which is not at all confirmed by the x-ray studies. This diffuse involvement of the upper end of the shaft is much more consistent with the type of osteomyelitis that sets in in young children before the epiphyses have united.

A similar picture may obtain in the early stages of the infection. His chart and clinical picture at the time of entrance to the hospital did not warrant a diagnosis of osteomyelitis of the sort that is consistent with these x-ray findings. The patient was in fairly good condition, his pulse was not particularly elevated, his temperature was not markedly elevated, he had occasionally increased white counts. So we realize that he must have had an accompanying infection along with his primary lesion, whatever that was. As I have said he also had a tumor, and the problem is to decide what sort of tumor.

Dr. Holmes has alluded to a few of the tumors which we ought to consider in a case of this sort. Osteogenic sarcoma accounts for the largest proportion of the primary bone tumors. Ewing's tumor is commoner in younger people. The lymphomatous tumors must also be considered. I have not mentioned any benign tumors. There is nothing about this picture which suggests the possibility of benign tumor. Dr. Codman shed light on this case the other day—not discussing this case, however. He said that only one bone may be involved in the early stage of Paget's disease but that the disease does not persist as a one-bone disease. If it does, then there is something wrong with the diagnosis. This patient came to the hospital before we routinely did blood-calcium studies and phosphatase determinations, so we do not have these findings to help or confuse the diagnosis.

The problem is, Which of the possible tumors are we dealing with? We have a process with destruction of bone, and a process with the formation of a good deal of new bone. We have something which looks almost like a pathologic fracture and which may have brought about the exacerbation of symptoms that brought him to the hospital. The rather rapid progress of this disease is of interest, namely, at the last admission he looked emaciated, whereas on the first admission, two months previously, he was a well-nourished and fairly healthy individual. The progress of the tumor itself is astonishingly rapid so far as the process in the soft tissue is concerned and in the bone. With both Dr. Simmons and Dr. Codman present, I do not feel that I should venture to offer the last word on the diagnosis of bone tumors, but it is my impression that we are dealing with osteogenic sarcoma regardless of the fact that the x-ray picture is not typical. I should say that on the sixth day the tumor was explored for an adequate specimen for the pathological department and that amputation was carried out. I should also say that almost regardless of the nature of the tumor the prognosis was fairly poor.

gist who reported it to show a staphylococcal osteomyelitis. The wound closed in two weeks, but one week later was reopened by the physician, it had drained continuously during the week before entry.

His past history and family history were non-contributory. He denied ever having had venereal disease.

Physical examination revealed a well-developed, fairly well-nourished male in no distress. The physical examination was negative except for the left leg, which showed a discharging sinus about 2.5 cm in length in an operative incision over the upper aspect of the tibia. The area around it was swollen and slightly tender. The knee was held in 30° flexion. Extension and flexion were possible but painful, and there were spasm and atrophy of the thigh muscles.

The temperature was 98°F, the pulse 90. The respirations were 20.

The urine examination was negative. The blood showed a hemoglobin of 70 per cent and a white-cell count varying between 11,000 and 18,000. The blood Hinton was reported negative three times.

An x-ray of the left tibia showed the upper third to have a mottled appearance due to numerous areas of increased density and irregular areas of decreased density. The cortex had a moth-eaten appearance, and there was a considerable amount of new-bone formation about the upper shaft. The changes were quite diffuse, extending from the cartilage surface downward and fading out in the mid-shaft. There was very little increase in the size of the bone. The changes appeared to involve both the medulla and the cortex. An x-ray of the chest was negative.

His chart remained flat, and on the ninth day the lesion was widely incised and packed with iodoform gauze. There was a collection of pus on the anterior surface of the tibia. The bone itself was very dense and stony hard, and the periosteum and superficial cortex were destroyed. Some of the necrotic bone was gouged out. Biopsies were taken which, on pathological examination, showed acute and chronic osteomyelitis. Cultures of the material showed staphylococci in the broth, but no growth on a blood-agar plate. He was discharged on the thirtieth day with his wound still draining.

Second Admission (one week later). During the interval, wet dressings were applied to his wound daily by the district nurse. On the day before re-entry a painful, red, hot swelling appeared just above the wound and increased rapidly in size.

Physical examination revealed the infrapatellar bursa to be red, tender, swollen and fluctuant. There was no lymphangitis or swollen nodes. The operative wound was open and necrotic bone could be seen at its base.

The temperature was 103°F, the pulse 95. The respirations were 28.

The urine examination was negative. The blood showed a white-cell count of 18,500.

On the day of entry the fluctuant area was incised, and a large pocket of pus was found which extended across the entire anterior surface of the tibia just above the upper end of the previous incision. The abscess was packed with iodoform gauze. Culture of the material showed no growth on a blood-agar plate. On the second day the temperature dropped to normal and remained there until discharge. An x-ray on the seventh day showed a large operative defect involving the shaft of the tibia. The amount of bone destruction had apparently increased somewhat. He was discharged on the ninth day.

Final Admission (two months later). For three weeks after discharge he was in good health and thought that his lesion was healing properly. However, at the end of that time, five weeks before re-entry, he began to have very severe pain in his left knee which at first occurred only at night and wakened him from his sleep. Often the pain radiated deep to the inner side of the thigh or down the lower leg to his foot where it was needle-like in character. About two weeks before re-entry the pain had become almost constant, both day and night. At that time he noticed a swelling over the patella which gradually extended around into the popliteal space. It was very hot, red and tender to deep pressure. The swelling around his operative wounds also increased in extent. The wounds had continued to drain pus ever since his last operation. His general health was good except for occasional toothaches. He had no fever or night sweats.

Physical examination showed a somewhat emaciated man. The left knee was very much swollen and held in 30° flexion. There was a large swelling below the left knee with a deep fissure in it, lined by apparent granulation tissue. The skin over the swelling did not seem inflamed. A movable, non-tender node measuring 2.5 by 2 cm was palpable in the left groin.

The temperature was 99°F, the pulse 140. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,200,000 with 80 per cent hemoglobin and a white-cell count of 14,000 with 64 per cent polymorphonuclears. The blood Hinton was again negative.

An x-ray of the leg showed a large, lobulated, soft-tissue mass surrounding the upper portion of the tibia and the knee joint. The operative defect was less sharply defined and appeared to be partially filled in by new bone. There was some peri-

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DEPARTMENT OF MENTAL DISEASES

DURING the past year a Recess Commission, appointed by Governor Hurley, has been examining the state mental hospitals with a view to ascertaining the merits and demerits of the system and of making such recommendations to the Governor and Legislature as would tend to improve the care of the patients and in general increase the efficiency of the hospitals in carrying out the purposes for which they were established. This commission appointed committees from the personnel of the state institutions and other psychiatrists of prominence to make reports to it on a variety of subjects connected with the various phases of hospital administration and care. These subcommittees reported to the commission and recently this body made a lengthy report to the Governor in which were incorporated its recommendations.

It is gratifying to note that the commission found that, on the whole, the administration of the state hospitals of Massachusetts was efficient and humane, and thus lived up to the traditional standard of this Commonwealth. Despite the recent cataclysm which removed from the service of Massachusetts several distinguished psychiatrists, they found that the morale of the institutions was good, research was going on in several places in a creditable manner, the patients were on the whole well cared for, and the superintendents and personnel of the institutions were men and women of standing. There were minor criticisms, these related generally to the executive work of the institutions.

The most important recommendation which the commission made was in regard to the central executive division in the Department of Mental Diseases. At present there is a paid commissioner and four unpaid associates. In addition to the unpaid commissioners there is one assistant commissioner and three assistants to the assistant commissioner who are men selected from the state hospital service and who are, so to speak, being groomed for superintendencies and other executive positions in the state service. This training is an important and valuable part of the set-up. It is proposed that three commissioners be appointed who are to be paid. The first executive would be a psychiatrist of at least seven years' experience and one who is a member of the American Board of Psychiatry and Neurology. Of the other two, one would be a physician, not necessarily a psychiatrist, and the other a person with civic and executive experience. This group of three would supplant the present unitary head and in general take over the powers of the boards of trustees of the various institutions, including the appointments of the entire medical personnel, the duties of the boards would be minor and supervisory rather than as at present collateral with the powers of the superintendents of the various institutions.

There are several things to be said in favor of and against the proposed changes. From the standpoint of efficiency it would seem better theoretically to have the superintendents appointed by the commissioners rather than by the boards of

DR TRACY B MALLORY Have you any comment, Dr Codman?

DR ERNEST A CODMAN I did not come in in time to hear the story. The films suggest that the lesion is such a difficult one to diagnose that I should like to avoid any trouble. Do not believe what Dr Taylor says. When he can diagnose a case, I probably can, and vice versa. But when we are both puzzled, the x-ray man will probably be puzzled and the pathologist also.

DR MALLORY Every bone-tumor patient in this hospital is an old friend of Dr Simmons. He can tell us more about this patient than anyone else can.

DR CHANNING C SIMMONS I know this case because I operated on the patient. I did not see him until the third admission, when he had a fungating ulcerating tumor, visible in the third x-ray film. We reviewed the x-rays, and Dr Holmes changed his diagnosis, based on the earlier films, to tumor and osteomyelitis. In talking with Dr Mallory, he was not sure the sections were merely osteomyelitis and thought there might be tumor as well. Therefore we amputated, and discovered it was a reticulum-cell sarcoma. The man is perfectly well, three and a half years later. It is one of those unusual tumors of the reticulum-cell type, which metastasize very late. Unquestionably it is failure to recognize this type of tumor which accounts for many of the so-called cures of osteogenic sarcoma.

PREOPERATIVE DIAGNOSIS

Ewing's tumor

DR TAYLOR'S DIAGNOSES

Osteogenic sarcoma
Osteomyelitis (secondary)

ANATOMIC DIAGNOSIS

Reticulum-cell sarcoma

PATHOLOGICAL DISCUSSION

DR MALLORY This is a type of tumor that Dr Frederic Parker, Jr., at the Boston City Hospital deserves the credit for recognizing and describing. He has pointed out that it is a fairly common primary tumor of the bone, and as Dr Simmons has said, the prognosis is relatively good compared with that of any other primary malignant tumor of bone. At the time when this case was biopsied and operated upon I was not recognizing this tumor, and I called it a Ewing tumor. It was not osteogenic sarcoma, nor did it look like lymphoma, I did not know what to call it. It was definitely not characteristic of Ewing's tumor, but for lack of anything better, that is what we put down. In reviewing the slides in subsequent years, it has become clear to all of us, and Dr Parker has checked on the specimen, that it is a rather typical example of reticulum-cell sarcoma. There was, however, very extensive secondary inflammation, and the first biopsy was quite an unsatisfactory one. On a specimen similar to that removed at the second biopsy we should be able today to make a correct diagnosis.

disease is cured by a few tablets which can be purchased at any drugstore, not only will the respect for gonorrhea diminish, but many people will consider themselves cured when actually they are highly infectious. In the last paragraph of the article, reference is made to the serious complications that may result from sulfanilamide treatment, we fear that some readers may not read that far, or if they do, may disregard the warning.

Such publicity as this is misleading and dangerous, and may be the means of damning a really useful drug.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 57 PREMATURE SEPARATION OF THE PLACENTA

Mrs H, a white, thirty-three-year-old woman in her second pregnancy, was eight months pregnant when admitted to the hospital at 10.30 a. m., December 3, 1934. She complained of abdominal pain, dizziness, blurred vision and vaginal bleeding of two and a half hours' duration. This pregnancy had been uneventful until November 23, when she experienced some lower abdominal pain, which disappeared in a few hours. Her ankles had begun to swell on November 29. Slight vaginal bleeding had occurred December 1, but there was no associated abdominal pain. The family physician had found a high unengaged fetal head, the edema of the ankles had increased and the hands had become puffy. Her physician was called on the morning of entry and noted marked bleeding from the vagina and a uterus of board-like consistence. At this time abdominal pain and uterine tenderness were marked and persistent. She had not experienced fetal motion since 6.00 a. m.

There was no family history of diabetes, tuberculosis, cardiorenal disease or malignancy. The patient's health had always been good. Her periods began at fourteen and had always been regular and of the twenty-eight-day cycle. She had had an uncomplicated pregnancy in 1920. Her last period

started on March 24, making the expected date of confinement December 31.

On physical examination there was a generalized edema. The mucous membranes were pale. Her tongue was coated and pale. The lungs were normal. The heart was not enlarged, and there were no murmurs. Her blood pressure was 144 systolic, 110 diastolic, the pulse was 80 and exceedingly weak. The uterus was the size of a full-term intrauterine pregnancy and was of ligneous consistence, it was impossible to outline definitely the fetus. The fetal heart was not audible. Palpation of the uterus caused excruciating pain.

A catheter specimen of urine revealed a large trace of albumin and many finely granular and hyaline casts. Blood examination showed a count of 2,800,000 red blood cells, with a hemoglobin of 58 per cent (Sahli). Blood typing and matching for transfusion were immediately carried out, and the patient was prepared for vaginal examination.

She was transferred to the operating room which was set up for a laparotomy as well as for pelvic examination. She was anesthetized with light gas-oxygen anesthesia. A sterile vaginal examination revealed that the head was high, but it could be pushed into the pelvis, a fact which showed there was no cephalopelvic disproportion. The cervix was soft and measured 1 cm. in thickness, the internal os was 1.5 cm. in diameter. There was no evidence of placenta previa. The fetal membranes were artificially ruptured, and as much amniotic fluid as possible was drained from the uterus. The amniotic fluid was clear. The lower uterine segment, cervix and vagina were tightly packed with nine yards of sterile 2-inch gauze. Thick perineal pads were applied to the vulva. Two many-tailed abdominal binders were tightly applied to the abdomen from above downward. A perineal binder was tightly applied over the perineal pads and fastened securely to the abdominal binder. A special sheet, 45 cm. wide, was then applied around the patient's abdomen at the level of the uterus and tightened from the side (Spanish windlass). Morphine sulfate ($\frac{1}{4}$ gr.) was administered in the operating room.

The patient was returned to the labor room in fairly good condition at 12.30 p. m. The blood pressure was 135 systolic, pulse 88. At 1.00 p. m. she was given 0.13 cc. (2 min.) Pitocin intramuscularly, this was repeated every forty-five minutes for three doses. She was then given 0.2 cc. (3 min.) every forty-five minutes for three doses. Labor began at 1.30 p. m. and progressed normally. Morphine sulfate ($\frac{1}{6}$ gr.) was given at 1.30 p. m. Sodium amytal (6 gr.) was administered by rectum at 2.00 p. m. Throughout the labor the blood pressure remained between 135 and 142 systolic,

trustees, since laymen are presumably not sufficiently well acquainted with the qualifications of a psychiatrist to make a selection for such an important office. There is, however, a serious danger in overcentralization of power, one which should be carefully weighed against the factor of efficiency. It is conceivable that a governor might, by obtaining ascendancy over the commissioners, make a clean sweep of every physician in the state-hospital service. Such abuse of power is not without precedent, even in Massachusetts. On the whole, there ought to be a factor of safety—a buffering power, so to speak—against the possibility of political interference. It has been quite common in several of the western states for a new governor to remove through the commissioner's office the superintendents of the state hospitals and many of the important officers so that no continuity in service and experience was possible. While the power of the trustees should be modified, there ought to be provision made so that they can exert the effect of a brake against any drastic moves initiated in the commissioners' office.

Insofar as the change from one commissioner to three is concerned, the advantage to be gained does not seem to be clear. If a board of three is to be appointed, it would seem advisable to have, in addition to a psychiatrist as the first executive, an engineer, who would look after all the construction and physical maintenance problems of the institutions, and a steward, who would supervise the housekeeping, as the other two commissioners. There is no reason to expect that a psychiatrist will be a good engineer and a good steward in addition to his capability of controlling the medical care of the twenty odd thousand institutional patients.

It would seem better to have a single commissioner—a psychiatrist of at least ten years' experience and a member of the American Board of Psychiatry and Neurology, whose previous career has shown executive ability. On his staff of assistant commissioners there should be a chief engineer and a chief steward, as well as the present group of younger psychiatrists who are being trained for the higher executive positions.

All in all, the Recess Commission is to be congratulated on its fidelity to the job which it undertook, and medical men may well feel that all is not lost in the state hospitals of Massachusetts and that a tradition of service and humanitarianism, pre eminent in the country, is still being maintained irrespective of political eruptions and personal catastrophes.

SULFANILAMIDE AND GONORRHEA

PHYSICIANS who read *Science News Letter* for December 18, 1937, must have been astounded at the double column heading on page 388 proclaiming "Gonorrhea Cured in Three Days by Sulfanilamide Treatment." The first paragraph reports Professor Alyea of Duke University as saying that of one hundred and fifty-eight patients so treated, four fifths "made these rapid recoveries."

Without having Professor Alyea's article for study, one is not in a position to criticize this statement. It may be said, however, that results even approximating these have not been obtained in this section of the country. Sulfanilamide gives promise of being a most useful drug in the treatment of gonorrhea, it is perhaps the nearest approach that we have to a specific remedy. Its use, even in relatively small doses (30 or 40 grains a day), will cause a cessation of discharge within a few days, but the absence of appreciable discharge does not necessarily mean that the infection has cleared up. Even at that time, gonococci in large numbers may be found in the mucoid secretion of the urethra, and after the discontinuance of sulfanilamide, purulent urethritis may develop again. We must acquire a much greater experience in the use of this drug before we can speak with certainty of its value in the management of gonococcal infections.

It is most unfortunate that results such as these quoted by *Science News Letter* are presented to the lay reader. For years social hygiene organizations have endeavored to build up in the public consciousness an appreciation of the serious nature of gonorrhea and of the necessity for adequate medical treatment until the infection is thoroughly eradicated. If the public is led to believe that the

WORCESTER NORTH

Friday, February 11, at 4 30 p m., at the Burbank Hospital, Fitchburg Subject Complications in Obstetrics Illustrated by Case Histories. Instructor Joseph W O'Connor Edward A. Adams, *Chairman*

MISCELLANY

CONNECTICUT NEWS

HARTFORD HOSPITAL TO ENLARGE

The Hartford Hospital plans to break ground this spring for its new power plant, the first step in a \$2,500,000 construction program. Many gifts to this fund have been received recently, the largest single one being \$100,000 from Mrs Era C. Root, widow of Dr Edward K. Root for forty years a member of the Hartford Hospital staff Mrs. Root gave another \$100,000 to be held by the hospital as the Edward King Root Maintenance Fund, the income to be used for current purposes of the institution

The nursing department of the hospital has become new hospital conscious and as a result has presented \$400 to the executive committee. Included in this contributing group were the graduate nurse staff, student nurses, training school-office staff, ward helpers, orderlies, sewing and dressmaking departments, surgical supply department, waitresses, kitchen staff, and chambermaids and telephone operators in the nurses' residence. The superintendent of nurses expressed the hope that the gift would inspire other employees of the hospital, as well as the public, to do their share.

CONTROVERSY OVER HARTFORD MUNICIPAL HOSPITAL

Mayor Spellacy, in his message to the Board of Aldermen on December 13, proposed that the Municipal Hospital be converted into an isolation hospital and that Hartford's indigent be hospitalized in the city's three privately endowed hospitals. Thus, the mayor stated, would save the city at least \$150,000 Careful study of the problem has revealed that such a step would actually cost the city more money It is a very real question whether the three private hospitals, as they stand today, could care for the indigent sick of the city The Mayor has set everyone thinking, and the result will probably be further economies in the management of the Municipal Hospital.

PROTECTION AGAINST HAZARD OF SPRAY COATING

The application of lacquer by means of a spray gun is an important industrial operation. The material sprayed contains some pigments which are toxic and from 75 to 90 per cent by weight of solvents, diluents and thinners, all of which are toxic, some much more so than others. It has been found increasingly evident that this spraying process is not properly safeguarded, particularly when the work is intermittent as in garage and auto-repair shops.

PUERPERAL MORTALITY DROPS

The deaths in Connecticut from puerperal diseases during the first ten months of 1937 were 57 as compared with 92 in the corresponding period of 1936 This decrease of 35 is most significant.

DEDICATION AT TRINITY COLLEGE

In Trinity College Chapel on December 11 a carved pew end was unveiled as a tribute to Horace Wells, discoverer

of anesthesia The ceremonies were a feature of a special vesper service attended by members of the Horace Wells Club, the Hartford Medical and Dental societies and students of Trinity College. The date marked the anniversary of the day in 1844 on which Dr Wells had Professor Colton, an itinerant lecturer on chemistry, administer nitrous oxide or laughing gas to him while he submitted to a dental operation at the hands of his friend Dr Riggs An address, outlining the scientific and historical aspects of the discovery of anesthesia, was made by Dr Walter R. Steiner, librarian of the Hartford Medical Society Library

The pew end contains three carved figures, a profile of Dr Wells in the center, a figure of Aesculapius, Greek god of medicine, at the top, and a representation of St. Apollonia, aged martyr at Alexandria and patroness against toothache

ANNUAL MEETING OF HARTFORD MEDICAL SOCIETY

The Hartford Medical Society held its annual meeting on January 3 Dr Edward J Whalen succeeded Dr Otto G Wiedman as president. Dr Howard W Brayton was elected vice president, and Dr J Raymond Glazier, secretary. Dr Franklin L. Lawton was re-elected treasurer, and Dr Walter R. Steiner, librarian. Dr Wiedman was presented with an engraved gavel on behalf of the members of the society by Dr Brannard In his address the retiring president discussed the increasing frequency of psychoneuroses as a cause of economic loss

TUFTS COLLEGE MEDICAL SCHOOL ALUMNI

The alumni of Tufts College Medical School in Hartford County met in Hartford on January 10 Dr Sidney H. McPherson presided. Drs Louis E Phaneuf, Alonzo K. Paine, Charles A. Haney, and Dean A. Warren Stearns were guest speakers Teams were organized to aid in raising \$2,000,000 for a new medical building and endowment fund at Tufts

CONNECTICUT DELEGATES AT WASHINGTON

Eight delegates attended the conference at Washington on better care for mothers and babies This conference was called by the Children's Bureau and arranged through a planning committee including every organization from the American College of Surgeons to the Junior League. The Connecticut delegates were Dr Stanley H. Osborn, commissioner, State Department of Health. Dr Martha L. Clifford, director, Bureau of Child Hygiene, Miss Hazel V. Dudley, R.N., director, Bureau of Public Health Nursing, Dr Ira V. Hiseock, professor of public health, Yale University. Dr Joseph I. Linde, Connecticut chairman, American Academy of Pediatrics, Dr J. Harold Root, president, Hezekiah Beardsley Pediatric Club, and Dr Robert M. Lewis, of New Haven.

HEALTH OFFICERS APPOINTED

Arthur J. Couture, M.D., has been appointed town health officer of Sterling for a term of four years.

George S. Lambert, M.D., has been appointed health officer for the borough of Danielson and acting health officer for the town of Killingly

DEATHS

TENNEN—JOSEPH S. TENNEN, M.D., forty three, physician in Stamford for twelve years, died in the University of Michigan Hospital, Ann Arbor, Michigan, December 12,

pulse between 88 and 96. The cervix was fully dilated at 4 30 p. m. The pack was expelled at 5 00 p. m. and was followed by a stillborn infant weighing 5 lb., 12 oz. Upon delivery of the infant the placenta was immediately expelled, followed by 1200 cc of blood with clots. The uterus continued to ooze slightly, but this was controlled by uterine tamponade. The blood pressure after delivery remained low. Because of the large blood loss, a transfusion of 500 cc of citrated blood was given. The blood pressure then rose from 75 systolic to 130 systolic, 80 diastolic, and the pulse came down from 130 to 104. The uterus reacted well, and there was no staining through the pack. This was removed twenty-four hours later, following which the uterine flow was normal.

On December 6, three days after delivery, there were 2,500,000 red-blood cells per cu. mm., and the hemoglobin was 48 per cent. Urine examination showed a very slight trace of albumin and an occasional cast. On December 13 the phenolsulfonphthalein test showed 34 per cent excretion of the dye in two hours. Two days later the Mosenthal test revealed a variation of specific gravity during the day of from 1.010 to 1.013. The non-protein nitrogen was 52 mg. per cent, and the blood pressure 140 systolic, 108 diastolic. On December 17 the hemoglobin was 74 per cent, red-blood-cell count 3,900,000—an improvement following iron plus dietary treatment. The urine showed the slightest possible trace of albumin and no casts.

She was discharged on the fourteenth postpartum day after having made an afebrile, uncomplicated convalescence except for slight subinvolution of the uterus.

Comment. This case illustrates the value of the conservative treatment of rupturing the membranes, packing the cervix and vagina, and applying a many-tailed bandage for fundal pressure, in the presence of a dead baby and placental separation. There is always the remote possibility that the uterus cannot contract after delivery, which may necessitate hysterectomy. While this is possible, it is not probable, and its frequency does not make the abdominal operation justifiable.

The use of small doses of Pitocin, or other drugs containing extracts of the posterior lobe of the pituitary gland, in cases that are being induced, has a distinct place in obstetrics. Its use should be limited to the hands of men who are trained in obstetrics. The size and frequency of the doses used in this case are open to criticism. Most men would use only 0.07 cc (1 minim) and repeat only once.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning February 7.

BRISTOL NORTH

Thursday, February 10, at 4 00 p. m., at the Morton Hospital, Taunton. Subject: Differential Diagnosis of Scarlet Fever and Its Treatment. Instructor: Edwin H. Place. Arthur R. Crandell, *Chairman*.

BRISTOL SOUTH (New Bedford Section)

Friday, February 11, at 4 00 p. m., at St. Luke's Hospital, New Bedford. Subject: Prophylactic Measures in the Treatment of Measles. Instructor: R. Cannon Eley. Robert H. Goodwin and Howard P. Sawyer, *Chairmen*.

ESSEX SOUTH

Tuesday, February 8, at 4 00 p. m., in the Nurses Home, Salem Hospital, Salem. Subject: Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor: Sylvester McGinn. Walter G. Phippen, *Chairman*.

MIDDLESEX EAST

Tuesday, February 8, at 4 00 p. m., at the Melrose Hospital, Melrose. Subject: The Use of Vitamins in Pediatric Practice. Instructor: Louis K. Diamond. Joseph H. Fay, *Chairman*.

MIDDLESEX NORTH

Friday, February 11, at 7 00 p. m., at St. John's Hospital, Lowell. Subject: Treatment of Burns. Instructor: Robert H. Aldrich. William S. Lawler, *Chairman*.

NORFOLK

Friday, February 11, at 8 30 p. m., at the Norwood Hospital, Norwood. Subject: Bleeding in the First Trimester of Pregnancy. Instructor: Raymond S. Titus. Hugo B. C. Riemer, *Chairman*.

NORFOLK SOUTH

Monday, February 7, at 8 30 p. m., at the Quincy City Hospital, Quincy. Subject: Complications in Obstetrics Illustrated by Case Histories. Instructor: Roy J. Heffernan. David L. Belding, *Chairman*.

PLYMOUTH

Tuesday, February 8, at 4 00 p. m., in the Rosa Field Nurses Residence, Brockton Hospital (rear of hospital), Brockton. Subject: Pneumococcus Pneumonia and Serum Therapy. Instructor: Frederick T. Lord. Walter H. Pulsifer, *Chairman*.

WORCESTER (Milford Section)

Thursday, February 10, at 8 30 p. m., in the Nurses Home of the Milford Hospital, Milford. Subject: The Use of Vitamins in Pediatric Practice. Instructor: Harold L. Higgins. Joseph Ashkins, *Chairman*.

LABORATORIES FOR PNEUMOCOCCUS TYPING AND SERUM DISTRIBUTION			
CITY OR TOWN	HOSPITAL OR DEPARTMENT OF HEALTH	TYPE OF THERAPEUTIC SERUM FOR DISTRIBUTION*	
Amesbury	Amesbury Hospital	†	
Attleboro	Sturdy Memorial Hospital	1	
Ayer	Ayer Community Memorial Hospital	1	
Beverly	Beverly Hospital	1, 2, 5, 7	
Boston	Antitoxin and Vaccine Laboratory†	1, 2, 5, 7	
Boston	Beth Israel Hospital	1	
Boston	Boston City Hospital	1, 2, 5, 7	
Boston	Boston Dispensary	1	
Boston	Carney Hospital	1	
Boston	Faulkner Hospital	1, 2, 5, 7	
Boston	Massachusetts General Hospital	1	
Boston	Massachusetts Memorial Hospitals	1	
Boston	New England Deaconess Hospital	1	
Boston	Peter Bent Brigham Hospital	1	
(State House)	State Bacteriological Laboratory	1, 2, 5, 7	
Boston	St. Elizabeth's Hospital	1	
Brockton	Board of Health Laboratory	†	
Brockton	Brockton Hospital	1, 2, 5, 7	
Cambridge	Board of Health Laboratory	†	
Cambridge	Cambridge City Hospital	1	
Cambridge	Cambridge Hospital	1	
Chelsea	Chelsea Memorial Hospital	1	
Clinton	Clinton Hospital	1	
Everett	Whidden Memorial Hospital	1	
Fall River	Fall River General Hospital	1	
Fall River	St. Anne's Hospital	1	
Fall River	Truesdale Hospital	1	
Fall River	Union Hospital	1	
Fitchburg	Burbank Hospital	1, 2, 5, 7	
Frammingham	Frammingham Union Hospital	1, 2, 5, 7	
Gardner	Henry Heywood Memorial Hospital	1	
Gloucester	Addison Gilbert Hospital	1	
Great Barrington	Fairview Hospital	1	
Greenfield	Franklin County Hospital	1, 2, 5, 7	
Haverhill	Hale Hospital	1, 2, 5, 7	
Holyoke	Holyoke Hospital	1	
Holyoke	Providence Hospital	1, 2, 5, 7	
Hyannis	Cape Cod Hospital	1, 2, 5, 7	
Lawrence	Lawrence General Hospital	1	
Leominster	Leominster Hospital	1	
Lowell	Lowell General Hospital	1	
Lowell	St. John's Hospital	1	
Lowell	St. Joseph's Hospital	1, 2, 5, 7	
Lynn	Lynn Hospital	1, 2, 5, 7	
Lynn	Union Hospital	1	
Malden	Malden Hospital	1	
Marlboro	Marlboro Hospital	1	
Melrose	Melrose Hospital	†	
Middleboro	St. Luke's Hospital	1	
Milford	Milford Hospital	1	
Nantucket	Nantucket Cottage Hospital	1	
Nauk	Leonard Morse Hospital	1	
New Bedford	St. Luke's Hospital	1, 2, 5, 7	
Newburyport	Anna Jacques Hospital	1	
Newton	Newton Hospital	1	
Norfolk	Pondville State Hospital	1, 2, 5, 7	
North Adams	North Adams Hospital	1	
Northampton	Cooley Dickinson Hospital	1	
Norwood	Norwood Hospital	1	
Oak Bluffs	Martha's Vineyard Hospital	1	
Palmer	Wing Memorial Hospital	1	
Peabody	J. B. Thomas Hospital	1	
Pittsfield	House of Mercy Hospital	1, 2, 5, 7	
Pittsfield	St. Luke's Hospital	1	
Plymouth	Jordan Hospital	1	
Pocasset	Barnstable County Sanatorium	1	
Quincy	Quincy City Hospital	1, 2, 5, 7	
Salem	Salem Hospital	1	
Somerville	Somerville Hospital	1	
Southbridge	Harrington Memorial Hospital	1	
Springfield	Springfield Hospital	1	
Springfield	Mercy Hospital	1, 2, 5, 7	
Springfield	Wesson Memorial Hospital	1	
Taunton	Morton Hospital	1	
Waltham	Waltham Hospital	1	
Ware	Mary Lane Hospital	1	
Webster	Webster Hospital	1	
Westfield	Noble Hospital	1	
Worcester	St. Vincent's Hospital	1	
Worcester	Worcester City Hospital	1, 2, 5, 7	
Worcester	Worcester Hahnemann Hospital	1	
Worcester	Worcester Memorial Hospital	1	

Serum for Type VIII is in preparation and as soon as it is available, it can be obtained in the same laboratories as Types II, V and VII.

†Therapeutic serum is not available through this laboratory.

*No typing done at this laboratory.

Additions to and changes in this list are made from time to time. Due to the high cost of the serum the number of distributing stations is kept as low as possible. At present Type I serum is easily available in all parts of the State and serums for certain higher types are available at strategic points. The distribution of pneumococcus-antibody solutions is restricted to those hospitals, institutions or agencies equipped to do pneumococcus typing and employing bacteriologists or laboratory technicians who have been approved by the Department of Public Health as to their familiarity with typing procedures.

CORRECTION

In the January 27 issue of the *Journal* appeared a notice of the death of Dr. William Paris, of 139 Washington Avenue, Chelsea. Dr. Paris is very much alive, and the staff takes this opportunity of offering its apology for whatever inconvenience has resulted from the error.

RECENT DEATH

RESTALL—MALCOLM MORRIS RESTALL, M.D., of 66 Pleasant Street, Marblehead, died suddenly January 25 at his home. He was in his fortieth year.

Born in Everett he received his early education there, later attending Roxbury Latin School and graduating from Harvard University in 1922. He received his degree from the Harvard Medical School in 1926. After serving his internship at the Albany Hospital, Albany, New York, Dr. Restall established a practice in Marblehead. He was a staff member of the Salem Hospital and was also associated with the Mary Alley Hospital in Marblehead.

Dr. Restall was a fellow of the Massachusetts Medical Society and of the American Medical Association.

His widow, a daughter, his parents and a sister survive him.

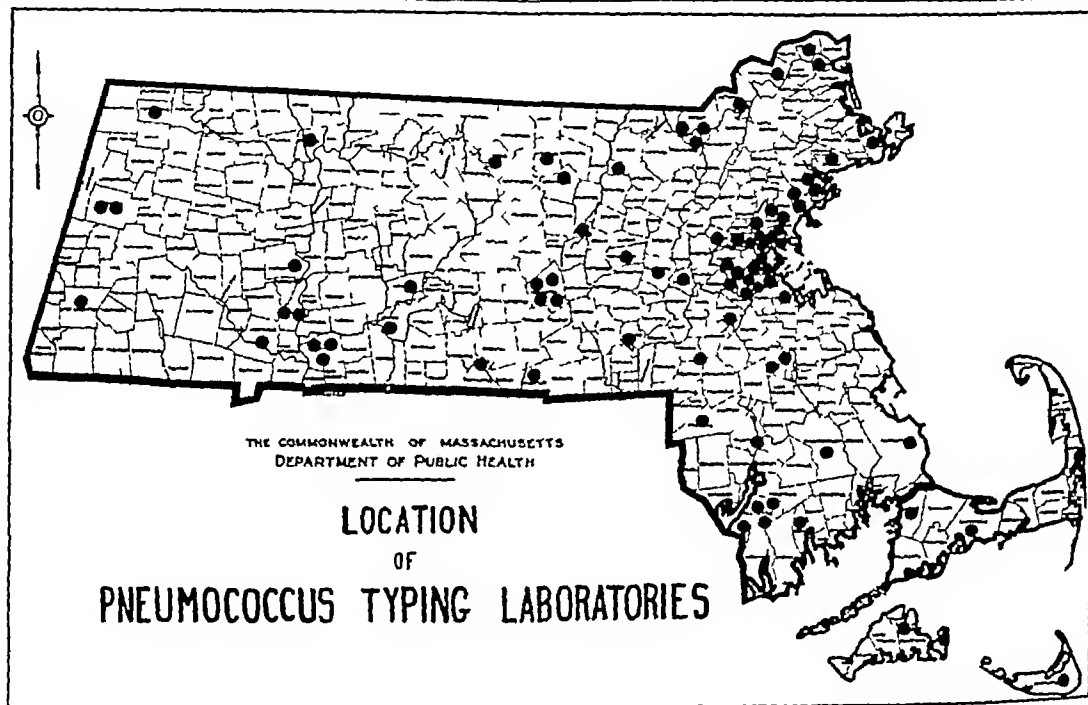
after an illness of three weeks. He is survived by his widow, daughter, father and mother.

BOYCE—**ROBERT V. BOYCE, M.D.**, forty-seven, former president of the Hartford Board of Health and a physician in the public schools, died of pneumonia at St. Francis Hospital on December 29. A native of Hartford, Dr. Boyce was a graduate of the University of Vermont College of Medicine and began general practice in Hartford following the World War. He was an obstetrician on the staff of St. Francis Hospital at the time of his death.

Dr. Boyce was vice president of the first Hartford Board of Public Welfare, formed after the old Board of Charities was abolished. He was appointed to the health board in 1933 and in 1936 was unanimously elected its head. During the flood of March, 1936, Dr. Boyce, as president of the board, worked tirelessly to direct the city's precautionary measures to prevent spread of disease as a result

of flood conditions. Under his direction inoculation of thousands of children and adults against typhoid fever was accomplished. In May, 1936, Dr. Boyce was named acting health officer of Hartford and in July of the same year resigned from the board at the expiration of his term as acting health officer. At the suggestion of Dr. Boyce the Division of Tuberculosis was added to the Hartford Board of Health in 1935, operating under the direction of a part time physician. Dr. Boyce was a member of the Hartford, Hartford County and Connecticut State medical societies and the American Medical Association.

He was the son of the late Mr. and Mrs. Robert H. Boyce. His wife, the late Mary (Murray) Boyce, died in June, 1935. He leaves four children: William M. Boyce, a student at Connecticut State College, Mary Elizabeth Boyce, Helen Burchmans Boyce, and Robert V. Boyce, Jr. He also leaves a sister, Mrs. David Broderick, of Oak Park, Illinois.



CORRESPONDENCE

PNEUMOCOCCUS-TYPING AND SERUM DISTRIBUTION SERVICE

To the Editor—The Massachusetts Department of Public Health is glad to be able to announce that anti-pneumococcal serum for Type VII is now available throughout the State. Serum for Type V has been available since late in the spring, so that pneumonias caused by Types I, II, V and VII can now be treated with serum available from this department. Serum for Type VIII is in preparation, and it is hoped that a supply will be released in the near future.

The present plan is to have a monovalent Type I serum, a bivalent serum for treating cases due to Types II and V, and a bivalent serum for treating cases due to Types VII and VIII. During the next few months a certain amount of the serum available will be bivalent serum for treating Types I and II, but as soon as present

supplies of this are exhausted, Type I will always be a monovalent serum.

Type I serum will be available at most of the approved typing laboratories throughout the State, as can be noted from the accompanying list. The supplies of the higher type serums are not sufficient to warrant placing them in all these laboratories, consequently they will be found at a few strategically located points throughout the State, as noted on the accompanying list. When serum for Type VIII is available, it can be obtained from the latter stations.

The dosage recommended for uncomplicated cases of Type VII is from 60,000 to 90,000 units, this should be increased under conditions outlined in the circular which accompanies the serum. When Type VIII is available, the dosage recommended for uncomplicated cases is 100,000 units.

HENRY D. CHADWICK, M.D.,
Commissioner of Public Health

State House,
Boston

BOSTON UNIVERSITY MEDICAL SOCIETY

There will be a meeting of the Boston University Medical Society in the Evans Memorial Auditorium, 78 East Concord Street, Boston, on Monday evening, February 7, at 8 o'clock.

PROGRAM

Presentation of Case.

Observations on the Diagnosis and Treatment of Brain Tumors. Dr Gilbert Horrax.

Medical students, nurses and physicians are cordially invited to attend.

BOSTON CITY HOSPITAL

The monthly clinicopathological conference will be held at the hospital on Wednesday, February 9, at 12 o'clock noon, in the Pathological Amphitheater

JOSEPH E. HALLISEY, M.D., *Secretary*
Medical Staff

GEORGE WASHINGTON GAY LECTURE

The annual George Washington Gay lecture at Tufts College Medical School will be delivered by Dr R. Nelson Hatt, of Springfield, on Thursday, March 3, at 4 00 p m.

Physicians, students and others interested will be welcome.

DWIGHT O HARA, M.D., *Vice Dean*

CUTTER LECTURE ON PREVENTIVE MEDICINE

The Cutter Lecture on Preventive Medicine will be given at the Harvard Medical School Amphitheater Building E, on Tuesday, February 15, at 5 00 p m. Dr Andrija Stampar, a member of the secretariat of the League of Nations, a delegate of the League of Nations to the National Economic Council of China, former director of health of Yugoslavia and professor extraordinarius for social hygiene in Zagreb, Yugoslavia, will speak on "Observations of a Rural Health Worker"

BOSTON DISPENSARY

25 Bennet Street, Boston
Lecture Hall, Second Floor, 9-10 a. m.

MEDICAL CONFERENCE PROGRAM, FEBRUARY, 1938

Friday, February 4—Present Status of Sulfanilamide Therapy Dr Maurice A. Schnitzer

Saturday, February 5—Recollections of Osler and MacKenzie. Dr Joseph H. Pratt

Tuesday, February 8—Follow up of Interesting Diagnostic Problems Presentation of former patients in the Diagnostic Hospital. Dr Heinrich G. Brugsch.

Wednesday, February 9—Hospital Case Presentation. Dr S J Thannhauser

Thursday, February 10—Social Service Case Presentation. Mrs. H. B. Hooker and Miss E. Grundy

Friday, February 11—Emotional Factors in Asthma Dr Felix Deutsch.

Saturday, February 12—Hospital Case Presentation. Dr S J Thannhauser

Tuesday, February 15—Clinicopathological Conference. Dr R. C. Wadsworth.

Wednesday, February 16—Hospital Case Presentation Dr S J Thannhauser

Thursday, February 17—Hyperventilation Syndromes Dr Maurice Sokolow

Friday, February 18—Some Recent Developments in Purpura and Hemophilia Dr Frederick J. Pohle

Saturday, February 19—Hospital Case Presentation. Dr S J Thannhauser

Wednesday, February 23—Hospital Case Presentation. Dr S J Thannhauser

Thursday, February 24—Gastrointestinal Clinic. Dr K S Andrews.

Friday, February 25—The Diagnosis of Multiple Myeloma. Dr Bernard Jacobson.

Saturday, February 26—Hospital Case Presentation. Dr S J Thannhauser

ALUMNI DAY—NEW YORK UNIVERSITY COLLEGE OF MEDICINE

All graduates of the New York University College of Medicine are cordially invited to participate in Alumni Day activities at the Medical College on Tuesday, February 22. As a fitting tribute to Dr John Wyckoff, the Committee on Science and Education has arranged a comprehensive and attractive program on heart disease. There will be special exhibits and demonstrations to illustrate the papers presented.

A complimentary luncheon will be given by the Alumni Association in the Student Lounge, and the last official function will be an informal reception at which Dean Currier McEwen will be the host. Since many classes have arranged for reunions that evening, the annual association dinner has been cancelled.

MASSACHUSETTS PSYCHIATRIC SOCIETY

The Massachusetts Psychiatric Society will hold its next meeting at the Boston Psychopathic Hospital on Friday evening, February 25, at 8 o'clock. Dr Ives Hendrick will speak on "The Contributions of Psychoanalysis to Psychiatry"

W FRANKLIN WOOD, M.D., *Secretary*

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, February 15, at 12 noon

Dr Dameshek will speak on "Hematological Problems in General Practice."

All physicians are cordially invited to attend.

JOHN B HALL, M.D., *Secretary*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, February 8, at 8 15 p m.

PROGRAM

Presentation of Cases

The Aging of Some Homeostatic Mechanisms. Dr Walter B. Cannon.

Medical students and physicians are cordially invited to attend.

MARSHALL N FULTON, M.D., *Secretary*

REPORTS OF MEETINGS

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital on December 7, Dr. John Homans presiding.

The first case was presented from the medical service by Dr. Reifstein. The patient was a 41 year-old clothing cutter. His past history was uneventful until somewhat over 2 years before entry when, while exercising strenuously, he had a sudden attack consisting of a sensation of severe pressure under the midsternum. This sensation radiated to the shoulders, and down the arms as far as the elbows. It was accompanied by nausea, perspiration and a sense of malaise. He had been promptly treated with bed rest, morphine and nitroglycerin, and after a few days had been able to resume his former activities. He had then been well until a week before entry when he had had a similar but somewhat more severe attack. Two days before entry he developed left facial weakness, and also weakness of the left arm and leg. His systolic blood pressure which had been as high as 160 dropped to 110. Physical examination was not abnormal save for the paralysis. Laboratory data and the electrocardiogram were not remarkable. During his hospital stay of 16 days there had been a gradual diminution in the muscular weaknesses. Dr. Marshall Fulton pointed out that the patient was considered to have had a coronary thrombosis with a cerebral embolus originating from a mural thrombus.

The surgical case was presented by Dr. Hoerr. A 64 year-old Irish housewife had been perfectly well until 2 weeks before entry save for varicose veins which she had had since the age of 22. Two weeks before entry she had changed her home to an extremely "damp" locality, and at that time began to have pain and some swelling along the medial aspect of the left leg. This had persisted until the time of admission. Physical examination was not remarkable except for a series of tender hard lumps along the course of the left saphenous vein. Dr. Homans pointed out that this was the usual course of thrombosis in varicose veins. He gave a short discussion of the formation of thrombi. Appearing first as accumulations of platelets upon a vessel wall, these become matted together as a lamellated structure among the interstices of which white corpuscles adhere and a little fibrin is laid down. This is known as the white clot. When this clot becomes large enough to produce stasis, erythrocytes are deposited and the red clot is formed. There are several factors which predispose vessels to thrombosis. The first of these is trauma, infection or inflammation of a vessel wall or the tissues about the wall. Dr. Homans cited a case of 'milk-leg' in which extensive inflammation was found around the pelvic vessels. Another cause of thrombosis is depletion of blood as after severe vomiting or diarrhea. Yet a third cause is slowing of the blood stream—a condition commonly found in relaxed, dependent limbs. Such causes tend to induce thrombosis in sites particularly favorable—especially the upper femoral and external iliac veins.

The paper of the evening was by Dr. C. H. Best, of the University of Toronto, who described experiments in the use of heparin in the prevention of thrombosis. Knowledge of heparin began in 1916 with the work of Howell upon the mechanism of blood clotting. Heparin has been shown to antagonize the action of thrombin and to some extent the action of prothrombin. Dr. Best also pointed out the importance of the work of the chemists at the University of Toronto and elsewhere, who had purified heparin sufficiently so that it could be produced in crystal line form. Describing his own work, he demonstrated

three lines of experimentation. In the first, experimental thrombi were formed in the veins of animals by crushing the veins by the injection of a corrosive fluid (Sorian). Following this, some of the animals were treated with a constant intravenous infusion of saline in which crystalline heparin was dissolved. These animals showed much less tendency to form thrombi than did the controls, and if the original injury was not too great and if the treatment was kept up for several days, there even was healing of the vein. The second line of research consisted of microscopic examination of the changes in platelets in the process of forming thrombi. To illustrate this, Dr. Best showed motion pictures taken through oil immersion lenses. In these the platelets could be seen settling on a glass surface, then sending out digitating processes along the surface, and finally undergoing degenerative changes and fusion. The third group of experiments made use of glass loops inserted into the veins of animals, for example, connecting the carotid and the jugular veins. Thrombus formation was observed in these loops, and motion pictures were shown to illustrate this. These showed the formation of the white thrombi and also the breaking away of these thrombi to form emboli. When heparin was introduced into the circulation these thrombi no longer formed, and those thrombi which had formed remained without further growth.

Dr. Best then spoke briefly of the application of these findings to the postoperative treatment of surgical patients who had undergone serious operations. Greatly diluted heparin was allowed to run into a peripheral vein, at a concentration aimed to keep the clotting time at 15 or 20 minutes, for a period beginning an hour or two after operation and lasting about 5 days. The result in the cases so far studied in Toronto has been entirely satisfactory.

HAMPSHIRE DISTRICT MEDICAL SOCIETY

A special meeting of the Hampshire District Medical Society was called on Tuesday evening, January 18, to act upon the resignation of Dr. Francis E. O'Brien as secretary-treasurer and to elect his successor.

It was voted to accept Dr. O'Brien's resignation. Dr. Joseph D. Collins was unanimously elected secretary-treasurer, his appointment becoming effective at that date.

BROOKFIELD MEDICAL CLUB

The January meeting of the Brookfield Medical Club was held at Ye Olde Tavern in West Brookfield on Wednesday, January 19, with Dr. Charles A. DeLand, of Warren, host, and Dr. John Fallon, of Worcester, guest speaker, his subject being 'Observations on Recent Therapeutic Measures as Noted at the Mayo Clinic and Surgical Clinics in Chicago.'

The February meeting will be held on the third Wednesday, with Dr. Joseph Slowick, of Palmer, as host.

J. R. FOWLER, M.D., Secretary

NOTICES

BOSTON TUBERCULOSIS ASSOCIATION

The annual meeting of the Boston Tuberculosis Association will be held at the Copley Plaza Hotel, Copley Square, Boston on Tuesday, February 15, at 4 p. m.

Dr. Henry F. Vaughan, commissioner, Department of Public Health, Detroit, Michigan, will be the speaker.

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VOLUME 218

FEBRUARY 10, 1938

NUMBER 6

THE ABSORPTION OF GLUCOSE FROM THE SMALL INTESTINE IN DEFICIENCY DISEASE

JUDA GROEN, MD *

AMSTERDAM, HOLLAND

IN A previous communication,¹ a simplified apparatus and technic for the study of intestinal absorption in man was described. The principle of the method, developed by Miller and Abbott,² consists in the occlusion of the upper part of the small intestine at a measured distance below the pylorus by a rubber balloon connected with the distal end of one of the two lumina of a rubber tube. The second lumen of the tube leads into a number of holes that open above the balloon. Through these holes 100 cc of 15 per cent glucose solution is introduced into the intestine, where it remains for half an hour, after which the remaining solution is removed by aspiration and repeated washings. The position of the tip of the tube, and thus the length (50 cm) of absorbing small intestine, is established by x-ray examination before the glucose is introduced. Adequate precautions prevent downward leakage and regurgitation into the stomach. Complete details of this technic are given elsewhere,¹ unless otherwise indicated, they will be referred to below as standard conditions.

It has been shown¹ that the amount of glucose absorbed from concentrated solutions under standard conditions in normal subjects is constant. Moreover, above a certain concentration (10 per cent) the amount of glucose absorbed is independent of the concentration of the solution introduced. Thus Cori's law³ has been confirmed for man. The normal absorption values under the standard conditions vary from 7 to 9 gm of glucose, averaging 7.77 gm. The age, sex and weight of the adult subject do not appear to have any detectable influence. Changes in the diet of relatively short duration do not affect the absorption rate.

RESULTS

The present observations are based on these facts, and deal with the absorption of glucose in pathologic conditions, with the standard technic. Mainly because the procedure of intestinal intubation requires a certain amount of co-operation on the part of the patient, the number of cases that could be satisfactorily examined was small. Of 13 patients, 3 (Cases 1, 2 and 3), had diseases of the alimentary canal in which diarrhea was an outstanding feature and had caused nutritional deficiency symptoms (anemia, pigmentation of the dorsa of the hands, smooth tongue). The other 10 cases exhibited deficiency disease of various types, without gross intestinal lesions, though in some instances with clinical evidence of intestinal dysfunction.

Glucose Absorption in Disease of the Intestine

One patient (Case 1), a sixty-year-old, white, single expressman, had been drinking heavily for twenty years. Four years before entry occasional vomiting and intermittent diarrhea began. Eighteen months before entry he began to lose appetite and weight. On admission he had a temperature of 101°F and showed emaciation and a dry scaly skin, pigmentation of the dorsa of the hands, atrophy of the lingual papillae, and a distended abdomen. He continued to have fever, and developed roentgenologic signs of infiltration in both upper lung fields and of fluid in the left pleural cavity. The liver was slightly enlarged. There was gastric anacidity after the injection of histamine. The Takata-Ara reaction was strongly positive and the patient had a moderate hypochromic anemia. Diarrheal stools showed an increased content of undigested starch and fat. Roentgenologic studies of the gastrointestinal tract were negative except for a somewhat dilated ileum and hypermotility of the colon. Ten weeks after

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital and the Department of Medicine, Harvard Medical School, Boston.

Formerly Rockefeller Foundation Fellow and Research Fellow, Thorndike Memorial Laboratory, Boston City Hospital.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, FEBRUARY 7

MONDAY FEBRUARY 7

- *4 p m. Physicians and medical students are cordially invited to attend a clinic presented by the medical surgical and orthopedic services of the Infants and Children's hospitals in the amphitheater of the Children's Hospital

TUESDAY FEBRUARY 8

- *9 10 a m Boston Dispensary Follow up of interesting diagnostic problems presentation of former patients in the diagnostic hospital Dr Heinrich G Brugsch.
- *10 a m 12-30 p m Tumor clinic Boston Dispensary
- *8 15 p m Harvard Medical Society Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance)

WEDNESDAY FEBRUARY 9

- *9 10 a m Boston Dispensary Hospital case presentation Dr S J Thannhauser
- *12 m Clinicopathological conference Children's Hospital Amphitheater
- 12 m Boston City Hospital Monthly clinicopathological conference Pathological amphitheater

THURSDAY FEBRUARY 10

- 8 30-9 30 a m Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Peter Bent Brigham Hospital
- *9 10 a m Boston Dispensary Social service case presentation Mrs H B Hooker Miss E. Grundy

FRIDAY FEBRUARY 11

- *9 10 a m Boston Dispensary Emotional Factors in Asthma Dr Felix Deutsch.
- *10 a m. 12 30 p m. Tumor clinic Boston Dispensary

SATURDAY FEBRUARY 12

- *9 10 a m. Boston Dispensary Hospital case presentation Dr S J Thannhauser
- *10 a m. 12 m Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A Christian

SUNDAY FEBRUARY 13

- 4 p m. Illustrated public health lecture, Faulkner Hospital auditorium Stomach and Duodenal Ulcer Dr Edward S Emery Jr
- 4 p m. Free public lecture. Harvard Medical School amphitheater of Building D Menstrual Disorders and the Menopause. (For women only) Dr John Rock.

*Open to the medical profession

FEBRUARY 3—Faulkner Hospital Clinicopathological conference, 5 p m

FEBRUARY 4 26—Boston Dispensary Medical Conference Program Page 245

FEBRUARY 5—Boston City Hospital symposium on hepatic and biliary diseases. Page 203 issue of January 27

FEBRUARY 7—Boston University Medical Society Page 245

FEBRUARY 8—Harvard Medical Society Page 245

FEBRUARY 9—Boston City Hospital Monthly clinicopathological conference Page 245

FEBRUARY 10—Pentucket Association of Physicians Hotel Bartlett 95 Main Street Haverhill 8 30 p m

FEBRUARY 14—American Board of Internal Medicine. Page 969 issue of December 9

FEBRUARY 15—Boston Tuberculosis Association Page 244

FEBRUARY 15—Cutter Lecture on Preventive Medicine Page 245

FEBRUARY 15—South End Medical Club Page 245

FEBRUARY 21—Boston Medical History Club 8 15 p m Boston Medical Library 8 Fenway

FEBRUARY 22—New York University College of Medicine. Alumni Day Page 245

FEBRUARY 25—Massachusetts Psychiatric Society Page 245

MARCH 1—Greater Boston Medical Society Beth Israel Hospital auditorium 8 30 p m

MARCH 3—George Washington Gay Lecture. Page 245

MARCH 10 11 12—New England Hospital Association Page 51 issue of January 6

APRIL 4 8—The American College of Physicians Page 41 issue of July 1

MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

JUNE 13 17—American Medical Association San Francisco.

OCTOBER 17 21—Clinical Congress of the American College of Surgeons New York City

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p m. New Bedford.

ESSEX SOUTH

FEBRUARY 9—Essex Sanatorium Middleton Clinic at 5 p m Dinner at 7 p m Speaker: Dr John B Hawes 2d Subject: Dust and Disease

MARCH 2—Lynn Hospital Clinic at 5 p m. Dinner at 7 p m. Speaker and subject to be announced.

APRIL 6—Gloucester Hospital Gloucester Clinic at 5 p m. Dinner at 7 p m. Speaker and subject to be announced.

MAY 5—Censors meet at Salem Hospital 3 30 p m

MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p m. Speaker and subject to be announced.

FRANKLIN

Meetings will be held at the Franklin County Hospital Greenfield at 11 a m the second Tuesdays of March and May

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club Stoughton, at 12 15 p m on March 16 and May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27

NORFOLK DISTRICT

FEBRUARY 23—Hotel Kenmore. 8 15 p m Dermatitis Venerea Due to Cosmetics and Industrial Irritants. Dr John G Downing. Discussion by Dr Francis P McCarthy

MARCH 29—Hotel Kenmore. 8 15 p m. Subject to be announced but to be related to diseases of the kidney Dr Albert A. Horner

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon.

FEBRUARY 3—Norfolk County Hospital South Braintree.

MARCH 3—Norfolk County Hospital, South Braintree.

APRIL 7—At the Quincy City Hospital

MAY 5—Annual meeting

PLYMOUTH

Meetings will be held at 11 a m. on March 17 April 21, May 8 and July 21.

SUFFOLK

MARCH 15—Joint meeting with Boston Obstetrical Society

WORCESTER

At the following meetings, except the annual meeting dinner will be at 6 15 to be followed by business session and scientific program.

FEBRUARY 9—Worcester State Hospital Worcester

MARCH 9—Memorial Hospital Worcester

APRIL 13—Hahnemann Hospital Worcester

MAY 11—Afternoon and evening annual meeting. Place and schedule of program to be announced.

BOOKS RECEIVED FOR REVIEW

Modern Treatment in General Practice Volume 1 Edited by Cecil P G Wakeley 436 pp Baltimore Williams Wood & Company, 1937 \$4.00

Diathermy Including diathermotherapy and other forms of medical and surgical electrothermic treatment. Elton P Cumberbatch Third edition. 576 pp Baltimore Williams Wood & Company, 1937 \$6.00

Les Hépatites Maurice Loeper 262 pp Paris Masson et Cie, 1937 60 Fr fr

Mentality and Homosexuality Samuel Kahn. 249 pp Boston Meador Publishing Company, 1937 \$3.00

International Clinics Edited by Louis Hamman. Volume 4 Forty-seventh Series. 343 pp Philadelphia, Montreal, London J B Lippincott Company, 1937 \$3.00

Surgical Pathology of the Diseases of the Neck Arthur E. Hertzler 237 pp Philadelphia, Montreal and London J B Lippincott Company, 1937 \$5.00

Les Explorations Fonctionnelles Noël Fiessinger 420 pp Paris Masson et Cie, 1937 70 Fr fr

Apoplexies Viscérales Séreuses et Hémorragiques (Infarctus Viscéraux) Raymond Grégoire et Roger Couve laire 178 pp Paris Masson et Cie, 1937 50 Fr fr

Les Acquisitions Nouvelles de l'Endocrinologie R. Rivière. Third edition 264 pp Paris Masson et Cie, 1937 45 Fr fr

tween 119 and 118 mg per 100 cc., averaging 134 mg

In the 6 patients (Cases 1, 2, 3, 4, 5 and 9) whose blood-sugar curve during the absorption was determined, a low sugar absorption was accompanied by a flat blood-sugar curve. The highest blood-sugar value obtained was 125 mg per 100 cc. after one hour, the lowest 88 mg. In some cases the blood sugar showed no rise above its fasting level. Figure 1 illustrates the upper and lower limits of the blood-sugar values in these patients com-

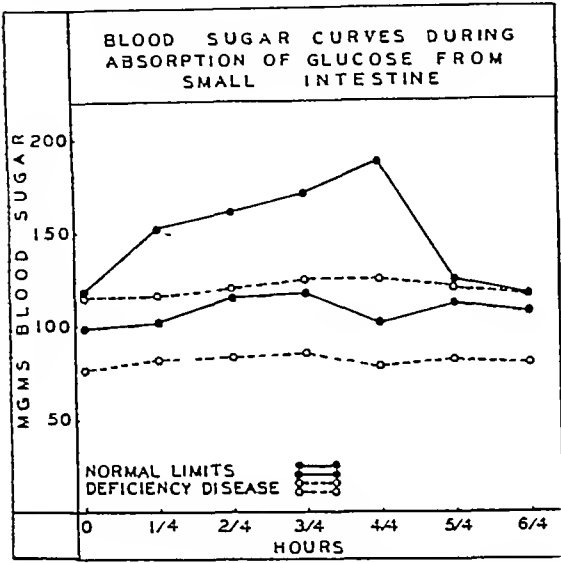


Figure 1 Upper and lower limits of blood-sugar values following introduction of 100 cc of 15 per cent glucose solution into a 50-cm segment of small intestine in normal subjects (solid circles) and in patients with defective absorption (Cases 1, 2, 3, 4, 5 and 9, open circles)

pared with the normal limits. The amount of glucose absorbed apparently exerts a definite influence on the blood-sugar curve.

DISCUSSION

Impaired absorption from the alimentary tract in patients with diarrhea might be supposed to result entirely from too rapid passage of the intestinal contents to allow opportunity for normal absorption. The decreases in absorption demonstrated above cannot, however, have been due to diarrhea only, as the glucose solution necessarily remained above the balloon in constant contact with the same area of intestine. It is therefore clear from the nature of the technic that the absorptive function of the intestinal wall itself was impaired whenever glucose absorption was found to be diminished, not only in the patients with undoubted organic disease of the intestinal tract (Cases 1, 2 and 3), but also in those with pernicious anemia (Cases 4, 5 and 6) and in the patient (Case 9) with "alcoholic" polyneuritis and pellagra. Nevertheless, this feature may be only partially responsible for

certain clinical manifestations presented by patients with chronic diarrhea. Thus, loss of body weight and flat blood-sugar-tolerance curves obtained by the usual technic may also be due in part to defective absorption resulting from too rapid passage of material through the intestinal tract.

The occurrence of deranged intestinal function, including poor absorption in certain deficiency diseases with prominent alimentary symptoms, has been suspected for some time.⁴ Pierce, Osgood and Polansky,⁵ Gál⁶ and Westenbrink and Overbeek⁷ have shown that rats given a diet deficient in one or more components of the vitamin-B complex absorb glucose from the alimentary tract at a slower rate than do normal controls. Trimble and Maddock⁸ found that dogs "in clinically unsatisfactory condition" had a diminished absorption. The work of Gross,⁴ McCarrison⁹ and Wheeler, Goldberger et al.,¹⁰ which has demonstrated pathologic changes in the intestinal mucous membrane of animals suffering from experimental nutritional deficiency, probably related to the vitamin-B complex, is also pertinent.

In certain human deficiency diseases severe intestinal disturbances occur. In the various forms of sprue the abundant fatty diarrhea and the excess of undigested starch in the stool justify the assumption of an impaired absorption. Less frequently, patients with pellagra, pernicious anemia or other less clearly defined conditions arising directly or indirectly from nutritional deficiency may show similar features.

Poor absorption, especially of glucose, has been assumed by many authors to exist in sprue. Thyssen^{11, 12} was among the first to point out that patients with sprue or celiac disease show only a very small rise in blood sugar after the ingestion of 50 or 100 gm of glucose by mouth. He doubted, however, whether this abnormal sugar-tolerance curve was due to poor absorption, as he also found abnormally flat curves after intravenous administration of glucose. Other observers,^{13, 14, 15} however, including ourselves,^{16, 17} have found that blood-sugar curves in sprue after intravenous administration of glucose are uniformly normal. Thus the conclusion is logical that the flat curve following the oral administration of glucose is probably caused by a slow absorption from the diseased intestine. In a certain proportion of cases of sprue the oral administration of large amounts of liver extract is relatively or wholly without effect on blood production as compared with the parenteral administration of the same material in usual doses.^{18, 19} Mackie and Pound²⁰ and Mackie, Miller and Rhoads²¹ have demonstrated abnormalities of the intestinal pattern by x-ray examination in cases of sprue and of so-called vitamin-B deficiency.

entry the patient died, and an autopsy disclosed tuberculosis of the lungs, intestine and peritoneum with marked involvement of the mesentery and its lymph nodes, and fatty degeneration of the liver.

Another patient (Case 2), an intelligent, sixteen-year-old Jewish boy, had suffered from diarrhea and intermittent bouts of fever for seven years. He had failed to grow normally, being only 4 feet, 7 inches tall and weighing only 59 lb. The tongue was smooth, the fingernails were small, and there was no pubic or axillary hair. The liver and

Table 1 *Absorption of Glucose under Standard Conditions in Intestinal Disease with Diarrhea*

CASE NO.	DIAGNOSIS	GLUCOSE ABSORBED
		gm.
1	Tuberculous enteritis and peritonitis	2.85
		4.85
		4.10
		4.10
2	Chronic ulcerative colitis	3.90
		3.90
3	Nontropical sprue	3.34
		4.84

spleen were enlarged. The stools contained much mucus and an excess of soaps and undigested starch. The stomach contained free hydrochloric acid. Roentgenologic studies of the gastrointestinal tract showed narrowing of the distal portion of the ileum and of the ascending and transverse portions of the colon. There was a marked hypochromic anemia. This case was considered one of severe chronic ulcerative colitis.

The third patient (Case 3) had moderately severe nontropical sprue with diarrhea.

As determined by seven separate observations on these 3 patients, there was a definite decrease in glucose absorption under standard conditions. As Table 1 shows, the values obtained were 2.85 to 4.85 gm., which is significantly below the normal range of 7 to 9 gm.

Glucose Absorption in Deficiency Disease Five patients with typical pernicious anemia (Cases 4 to 8) were studied, of whom 3 (Cases 4, 5 and 6) were tested both before and during remission induced or maintained by liver-extract therapy. All 3 patients showed a diminished absorption during the active stages of the disease and a return to normal after effective treatment. One patient (Case 8) was examined only during remission and had a normal absorption, as did another (Case 7) in mild relapse with 3,000,000 red-blood cells per cubic millimeter.

A patient with chronic alcoholism (Case 9), showing both polyneuritis and pellagra, had a diminished absorption which became normal after he had been successfully treated for three weeks by injection of liver extract, a nutritious diet and

autolyzed yeast. Two patients (Cases 10 and 11) with "alcoholic" polyneuritis were examined after treatment and had a normal absorption of glucose.

In contrast to the observations on these 8 cases, in which the deficiency may be related to some factor associated with or related to the vitamin B complex, are the results obtained in 2 patients with relatively pure scurvy (Cases 12 and 13). Both showed a normal absorption of glucose.

The data for the chief observations under standard conditions in all 10 patients are shown in Table 2.

Dilution inside the Intestine In the normal subjects,¹ the 15 per cent glucose solution that had been introduced into the intestine was diluted while absorption was going on by a stream of fluid moving into the lumen. After half an hour the concentration of the glucose solution was found to vary between 3.24 and 2.11 per cent, with an average of 2.50 per cent, or about half the osmotic concentration of the blood plasma. The calculated osmotic pressure of the glucose, plus that of the

Table 2 *Absorption of Glucose under Standard Conditions in Deficiency Disease*

CASE NO.	DIAGNOSIS	GLUCOSE ABSORBED	
		BEFORE TREATMENT	AFTER TREATMENT
		gm.	gm.
4	Pernicious anemia	5.87	8.92
5	"	4.67	7.48
6	"	3.33	8.43
7	" (mild relapse)	7.07	—
8	Pernicious anemia (remission)	—	9.13
9	Alcoholic polyneuritis and pellagra	5.60	8.25
10	Alcoholic polyneuritis and achylia	—	9.12
11	Alcoholic polyneuritis and achylia	—	7.59
12	Scurvy	8.02	—
13	"	7.96	—

chlorides and their cations recovered in the diluted glucose solution, was found to be approximately equal to that of the blood plasma. Apparently the normal intestine adjusts its contents so that the final total concentration inside its lumen is in osmotic equilibrium with the blood plasma.

With one exception, this diluting capacity of the pathologic intestine, as in the normal individual, was undisturbed. Indeed, unusually large amounts of isotonic fluid were recovered from the bowel half an hour after the introduction of the glucose. The exception was a patient (Case 6) in whom the glucose concentration half an hour after the introduction of the 15 per cent glucose solution was 3.60 per cent.

Blood-Sugar Values In the normal subjects¹ the blood sugar was found to rise while glucose was being absorbed from the upper part of the intestine. A fairly typical curve could be constructed that reached its peak after half an hour or an hour. At the peak of the curve the blood sugar was be

unsatisfactory diet, but there was no special restriction in the quantity of carbohydrate taken

Nonspecific Effect The poor absorption in our cases might be a nonspecific effect due to the fact that almost all the patients had poor appetites and had been taking only small amounts of food and fluids over a prolonged period before the tests were carried out. The poor absorption, in other words, might be the result of a prolonged undernutrition, by which the intestine had lost its ability to absorb a relatively large quantity of glucose such as was administered for the tests. The diminished absorption might also be considered as a nonspecific phenomenon resulting from the general ill-health of the body. These explanations cannot be entirely refuted. Cori³ has shown that the absorption rate of glucose in the rat decreases markedly after forty-eight hours of starvation. Also, as mentioned before, a flat glucose curve similar to that seen in sprue is found in cases of general undernutrition.

We⁴ have been able to perform absorption tests after complete starvation in 2 patients with epilepsy who were otherwise normal, so far as could be ascertained by clinical examination. One of these patients fasted for forty-eight hours, the other for ninety-six hours, the water intake was not restricted during these periods. At the end of the starvation period both showed a normal glucose absorption. It may be argued that forty-eight hours of starvation for the rat is a relatively more prolonged period than a four-day fast for a human subject, and that the starvation period was too short to allow alterations to occur. We have, however, other indications that the decrease of absorption in our patients must be more specific. Both patients with scurvy who were examined had taken a diet that consisted mainly of bread and of lean, excessively cooked meat, a diet deficient at least in vitamin C but not in caloric content. Both had a normal absorption rate of glucose. The caloric content of the diet had not been particularly low in 2 of the cases of pernicious anemia. It seems unlikely, therefore, that a deficient caloric intake or nonspecifically unbalanced diets can account for the impaired absorption found in our patients.

Vitamin-B Complex On the other hand, the 5 patients (Cases 4, 5, 6, 7 and 9) with diminished absorption fell into the group of vitamin-B-deficiency disease, if one may so consider pernicious anemia and "alcoholic" polyneuritis. In common with patients having pellagra and sprue, such patients frequently present evidence of derangement of the alimentary tract manifested as glossitis, achlorhydria or diarrhea. The parenteral administration of a fraction of liver soluble in 70 per cent

alcohol has been shown in each condition to cause prompt improvement of lingual and intestinal symptoms, and if macrocytic anemia is present to result in characteristically increased blood production. In many cases similar effects are obtained with hog-stomach preparations or with mixtures of beef muscle or autolyzed yeast with normal human gastric juice.^{22, 23} In some instances the administration of beef muscle or autolyzed yeast preparations alone produces such effects.¹⁹ These observations have been made while the patients were being maintained on diets devoid of power to induce remission in pernicious anemia. Such diets have contained no meat, fish or eggs and have consisted largely of refined carbohydrates. According to Castle and his associates,^{22, 23} the basis of these effects on blood production and glossitis is the presence in liver-extract preparations of a substance or substances produced in vivo from beef muscle or autolyzed yeast (extrinsic factor) by a constituent of the normal gastric secretion (intrinsic factor). Depending on the natural presence of intrinsic factor in the gastric secretion of the patient, a response to beef muscle or autolyzed yeast alone will be obtained. The administration of hog-stomach preparations supplies the extrinsic as well as the intrinsic factor.

It is proper to assume, at least for the purposes of this discussion, that pernicious anemia, sprue, pellagra and "alcoholic" polyneuritis are deficiency diseases due either to a direct deficiency in the diet,³⁰ or to a virtual deficiency conditioned by failure of gastric secretion or of intestinal absorption of one or more substances belonging to or closely associated with the vitamin-B complex.^{23, 31*} At any rate, it is clear that in each of these conditions under controlled dietary circumstances the parenteral administration of liver extract has been shown to have a promptly beneficial effect on glossitis and on blood formation. In many instances the effect on diarrhea is scarcely less striking.

A therapeutic test consisting of the administration of the vitamin B complex alone or with gastric juice, all other conditions remaining unchanged, could not be carried out on our patients. When treated in various ways, however, some by injection of liver extract, some by mixtures of gastric juice and various sources of extrinsic factor by mouth, all showed clinical improvement. Shortly an increase in appetite took place, and eventually the patients ate more and better food than they had ingested before treatment. The intake of fluid also increased. It is therefore impossible to conclude exactly what constituent caused the im-

*In this communication the designation vitamin B complex is given to a group of substances, constituents of liver meat yeast and so forth, that are soluble both in water and in alcohol and are necessary for the promotion of growth and for the prevention of changes in the skin, tongue, nervous system and blood of mammals. It includes the antineuritic vitamin flavin, George & B. Castle's extrinsic factor and probably other substances.

The existence of impaired absorption also suggests itself in those cases of pernicious anemia which require unusually large amounts of liver extract administered by mouth for their recovery or maintenance. Castle and his associates,²²⁻²³ for example, have presented evidence of this type, and consider that the presence of intestinal stenoses or short circuits may, through interference with absorption, account for the development of macrocytic anemia responding to the parenteral administration of liver extract. The association of the clinical manifestations of pellagra, beriberi and vitamin-A deficiency with disorders of the intestinal tract also suggests malabsorption. Keefe and his associates²⁴⁻²⁵ have noted the development of both hypochromic and macrocytic anemia and signs of vitamin-A-deficiency disease in cases of chronic dysentery. In many of these patients, however, the presence of intestinal lesions was associated with more or less restricted dietary regimes. Heath and Fullerton²⁶ have shown that the absorption of potassium iodide is sometimes greatly delayed in dietary deficiency conditions. The increased tolerance to galactose in pernicious anemia observed by Donath²⁷ and by Singer and Wechsler²⁸ has been ascribed to a slow absorption of this sugar from the alimentary canal.

In spite of the foregoing evidence, however, the existence of a diminished absorptive power of the intestinal wall in human deficiency disease needed proof by a direct test capable of excluding the possible influence of increased intestinal motility. Blood-sugar curves and excretion tests performed in the usual manner are all subject to other metabolic influences than absorption alone. The abnormal results of these tests, therefore, did not necessarily indicate a diminished absorption. However, any influence of increased motility of the intestine or of interfering metabolic factors was excluded by the technic employed in our experiments. They constitute apparently the first *direct* demonstration in man that the passage of material through the wall of the small intestine may be impaired in deficiency states. There is no doubt, therefore, that the flat blood-sugar-tolerance curve in sprue, in anemias from direct or indirect dietary deficiency, and in malnutrition is due, at least in part, to physiologic or pathologic changes in the absorbing mechanism per se. At the same time it should be borne in mind that our experiments deal with glucose only, an unpaired absorption of this sugar does not necessarily imply that other substances are also absorbed at a slower rate. Since glucose is a readily diffusible substance, however, it is reasonable to suppose that substances of greater complexity or of larger molecular weight would

encounter even greater difficulty. This does not imply what is clearly not the case, that the process of absorption is purely a matter of diffusion. It may at present be regarded as a likely supposition that the absorption is defective in deficiency diseases such as sprue, pellagra and pernicious anemia, and in less well-defined deficiency conditions presenting similar manifestations of the alimentary tract. The explanation of this poor absorption requires further consideration.

Achlorhydria apparently does not significantly affect glucose absorption. A patient (Case 2) with diminished absorption secreted free hydrochloric acid. The cases of pernicious anemia in which the absorption returned to normal after treatment still had gastric achlorhydria. One patient (Case 10) who had a normal absorption was known to have had a histamine-refractory achlorhydria of at least two years' duration. Moreover, it was found in normal subjects¹ that the addition of 0.1 normal hydrochloric acid to the glucose solution actually lowered its absorption rate.

Anemia The decrease in absorption could not be explained by the level of the hemoglobin or of the red-blood cells. A patient with "alcoholic" polyneuritis (Case 9) had no anemia, yet showed a definitely decreased absorption. A patient with anemia due to deficiency of vitamin C (Case 12) had a normal absorption.

Adaptation Westenbrink²⁹ has adduced evidence that the absorptive capacity of the intestinal canal is able to adapt itself to the constituents of the food. When rats were fed on a mixture containing glucose as the main carbohydrate, the absorption rate for glucose increased and that for galactose decreased. When the rats were fed on galactose the reverse took place. When they were fed on a diet rich in fat, the absorption for all carbohydrates diminished markedly. According to Westenbrink, the decreased glucose absorption in vitamin-B deficiency is not specific but is the result of the decreased appetite of the animal and the subsequent lower intake of carbohydrate.

To test Westenbrink's explanation on man, we have tried the effect of changes in diet of normal subjects upon the absorption of glucose. No change could be found when the relative amounts of carbohydrate and protein in the diet were varied. One of the subjects took a ketogenic diet containing only 25 gm of carbohydrate for ten days. No diminution in the absorption of glucose was found at the end of this period.¹ We therefore find it hard to ascribe the decreased absorption in our patients to a loss of adaptation. It is true that the history of our cases revealed poor appetite and an

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A PLASTIC OPERATION FOR THE CORRECTION OF HYPERTROPHY OF THE BREAST

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HYPERTROPHY of the female breast is not an uncommon affliction. It usually involves both breasts, but occasionally it is unilateral. The increase in size is caused partly by an increase in the amount of fat, but may also be accompanied by a variable degree of actual hypertrophy of glandular tissue. Increased obesity often seems to add disproportionately to the size of the breasts, and dietary measures offer only partial relief.

The degree of pendulousness is sometimes increased by lactation, often the patient has strapped her breasts down with a tight brassière in an effort to make them less conspicuous, and this has caused more or less elongation. These large breasts are a source of considerable discomfort, first because of their heavy weight, and further because of the inconvenience of the various types of support designed to hold them in position. Many patients have complained of tight brassière straps over the shoulders, which sometimes cause pain there, occasionally extending down the arms. The excessive weight often causes faulty posture, the patient assuming a slight stoop in an unconscious effort to conceal the breasts and make them less conspicuous. A certain amount of concealment can be accomplished through dress, but even the most skillful designer may fail to obtain the desired result, so that the patient feels deprived of the privilege of wearing certain types of gowns. Finally there is the problem of mental attitude.

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Some patients are so sensitive and self-conscious about what they feel to be their deformity that they are definitely handicapped in their social contacts, and deprive themselves of many normal activities in which they would otherwise take an active interest.

The accompanying photographs (Figs 1-5) demonstrate what can be accomplished by plastic surgery. These 5 cases were selected from a group of 15 to represent the different types which may be encountered. A few facts regarding the cases are as follows:

Case 1 A married woman of 35. She had had one child, who was breast fed. The breasts were long and pendulous, with only a moderate amount of fatty tissue. The postoperative photographs were taken 6 months after operation.

Case 2 A married woman of 34 who had had three children. All were breast fed. She had very heavy breasts, composed not only of hypertrophied gland tissue but also of an excessive amount of fatty tissue. The postoperative photographs were taken 6 months after operation.

Case 3 A single woman of 25 who had very heavy breasts composed largely of hypertrophied gland tissue. The postoperative photographs were taken 6 months after operation.

Case 4 A single woman of 30. Both breasts were heavy, but there was a very marked glandular hypertrophy on the left side. A plastic operation was done on both breasts, and the postoperative pictures were taken 10 days later. It should be noted that the breasts are quite high, on palpation they were very firm, with areas of induration caused by postoperative inflammatory reaction (some of these areas persist for several months, but eventually disappear).

provement of absorption during remission in these particular cases. By analogy with other clinical observations¹⁹⁻²³ under controlled conditions referred to above, however, the cases may reasonably be classed as either direct or conditioned vitamin-B-complex deficiency diseases, and may be presumed to have responded favorably to the administration of such substances either in specific therapeutic preparations or in the food included in the improved diets.

Castle²² has pointed out with reference to the development of pernicious anemia that in a patient with progressively diminishing power of secretion of the intrinsic factor a point would be reached where the extrinsic factor (vitamin-B complex) would no longer be effective in producing adequate amounts of liver extract. This result would diminish the patient's intake of the extrinsic factor through loss of appetite, and thus a vicious cycle would be established, leading to progress of the disease. We wish to suggest that in addition the vicious cycle would involve progressive decrease of the absorptive capacity of the intestine. Not only glucose but other substances might be absorbed with difficulty. If the diet taken by the patient were already poor in vitamin-B factors, poor absorption would decrease the utilization of even this small amount, or of any products of its interaction with residual amounts of the intrinsic factor. At first the intestine may be able, because of its great length, to compensate to some extent for the diminished absorption per unit of surface. In this stage, liver or stomach preparations given by mouth are still to some extent effective and may induce a remission. If intestinal absorption is further impaired, however, or if some additional circumstance (infection) interferes, therapy by mouth may require extremely large amounts of material in order to be effective. Some cases of pernicious anemia, and especially cases of chronic sprue, are apparently almost totally refractive to oral therapy owing to this absorption barrier. Parenteral administration of liver extract should then be resorted to in order to break the vicious cycle.

SUMMARY

By means of a simplified technic of intestinal intubation which had been previously standardized on normal individuals, the absorption of glucose was studied in 3 patients suffering from organic disease of the intestine associated with diarrhea, namely, 1 case of tuberculous enteritis, 1 of ulcerative colitis and 1 of nontropical sprue. In each case decreased absorption was demonstrated.

Among 10 patients with various dietary deficiency diseases, diminished absorption of glucose was found before treatment in 3 cases of pernicious anemia and in 1 case of "alcoholic" polyneu-

ritis with pellagra. Absorption of glucose in these 4 cases returned to normal after treatment. The absorption of glucose was found to be normal after treatment had been applied in 1 additional case of pernicious anemia and in 2 additional cases of "alcoholic" polyneuritis. However, 2 cases of scurvy before treatment showed a normal absorption of glucose.

Since by the nature of the experimental method the glucose solution was maintained in contact with the same portion of the upper small intestine, the diminished absorption was clearly due to defect of the absorptive capacity of the intestinal wall and not to unusually rapid passage of the intestinal contents. In those cases in which the absorption of glucose was diminished, the blood sugar showed a smaller rise during the absorption test than in control observations on normal subjects. The flat blood-sugar-tolerance curve often found in sprue, and sometimes in pernicious anemia and certain other dietary deficiency states, is therefore attributable, at least in part, to a diminished absorptive power of the intestine.

The decreased absorption of glucose in deficiency disease may be a nonspecific phenomenon, perhaps the result of an insufficient caloric supply over a long period of time. It is more likely, however, to be a specific effect due to a lack of some component or metabolic derivative of the vitamin B complex.

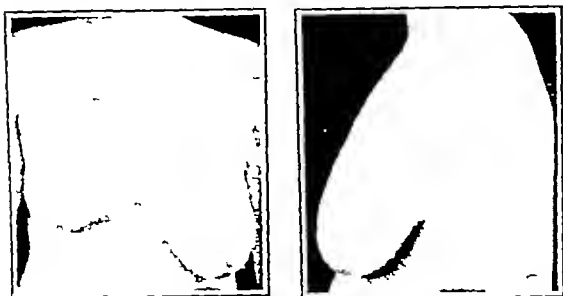
The author expresses his appreciation to Dr W O Abbott, Dr G W Karr, Dr C M. Jones, Dr H. C. Trumble and Dr W B Castle for advice and encouragement in the course of the work.

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Case 5 A single woman of 26, who had a marked glandular hypertrophy of the left breast. A plastic reconstruction was done. The postoperative photographs were



Preoperative



Postoperative

Figure 5 *Case 5*

taken 5 months later. The normal right breast was of the pointed type, which is difficult to duplicate by operation; however, the side view of the reconstructed breast is satisfactory.

The operation which I have done on these patients is a modification of the Biesenberger¹ procedure, as given in his small but comprehensive book covering plastic and cosmetic operations on the breast. The operation, which he advocated as the most satisfactory, was accomplished by a complete dissection of the skin from the glandular tissue, care being exercised to preserve the nipple with its areola. He then excised the excessive glandular and fatty tissue in order to reduce the breast to the desired size. The breast was reconstructed and sutured to the chest wall, the skin then being fitted around the breast and the excess skin excised at the lower margins. For the details of the operation which I have done I am indebted to Dr Yolande Huber, of New York City. I have carried it out as follows:

First, a circular incision is made around the nipple at the outer margin of the areola, or if the areola is too large, this incision may be made

within it. Another circular incision is made about 0.6 cm outside the first circular incision. From the lower margin of this outer circle a vertical incision is made down to the submammary fold in the skin below the breast. A horizontal incision from 7 to 10 cm long is then made along this fold, the skin flaps are carefully dissected from the breast tissue so as to leave the areola and the small ring of skin around it intact, the ring of skin serving temporarily to protect the areola against injury from manipulation. A moderate amount of fatty tissue is left on the under surface of the skin in order that no damage may be done to the circulation of the skin flaps. The entire gland is uncovered so that the pectoral muscle or the chest wall is exposed on all sides of the breast. The breast is then grasped by the apex, and segments of fat and glandular tissue are excised. This excision begins at the areola margin and is carried down to the chest wall, several segments may be removed until the breast is reduced to the desired size. It now appears as a long, thin mass of glandular tissue with the nipple and areola at its apex. In order to reconstruct this into a rounded mass, it is necessary to rotate it upon itself, suturing the folds to each other and suturing the margins to the chest wall. For this purpose fine silk sutures are used. The proper level for the upper margin of the breast is the second rib. The amount of rotation may be as much as 180 degrees. The extra ring of skin around the areola having served its purpose of protecting, is excised, and the skin flaps are carefully fitted around the reconstructed breast. It will be found necessary to excise a considerable amount of skin at the lower borders. No attention is paid to the areola until after the skin has been fitted and sutured. The opening for it is then made at the upper end of the vertical suture line. This opening is circular, and should be at least 2.5 cm wider than the contracted areola, so that when the latter is sutured to the margins of the opening it will be stretched to its normal size.

It is difficult to describe the operation adequately, but the accompanying group of outline drawings (Fig 6) in connection with the text will help one to visualize the successive steps.

The postoperative dressing is very important. A liberal amount of gauze dressing is used and over this plenty of sheet wadding, a scultetus swathe is then applied in such a way that it fits firmly and smoothly. Each tail is pinned to prevent loosening, and shoulder straps are attached to prevent slipping. A carefully applied elastic bandage may

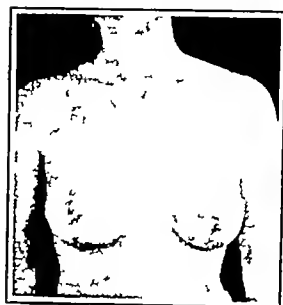
*Preoperative**Preoperative**Postoperative*

Figure 1 Case 1

*Postoperative*

Figure 3 Case 3

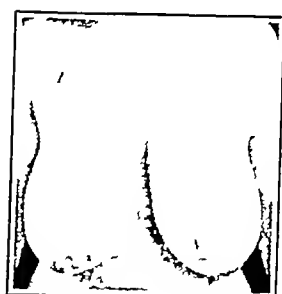
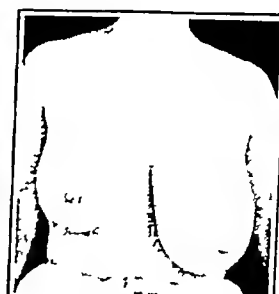
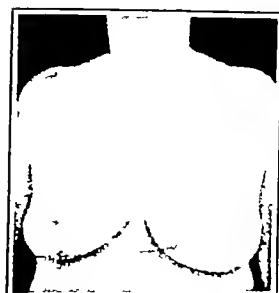
*Preoperative**Preoperative**Postoperative*

Figure 2 Case 2

*Postoperative*

Figure 4 Case 4

are notoriously poor as milk-producers. No one of my patients has yet been through a pregnancy, but in all cases both the glandular tissue left behind and the ducts leading to the nipple have been uninjured. I see no reason why these breasts should not function normally, or at least nearly as well as they would have if the operation had not been done.

330 Dartmouth Street.

REFERENCE

- 1 Biesenberger H. *Deformaten und kosmetische Operationen der weiblichen Brust*. 205 pp. Wien: Verlag von Wilhelm Maudrich, 1931.

DISCUSSION

DR. GEORGE C. WILKINS, Manchester, New Hampshire. Evidently the women in my locality with large breasts accept the condition with a certain equanimity, at any rate they do not apply to me for relief. The operation described by Dr. Sowles is a very clever one. I know the principles of one or two other procedures in which the skin about the nipple is slid up under a bridge of skin and most of the lower part of the breast is removed. Technically, his method is of course far superior to these, but its success appears to depend entirely upon the most scrupulous attention to details.

DR. CHARLES L. LARAIN, Waterbury, Connecticut. I com-

pliment Dr. Sowles on the splendid results he has obtained. He has emphasized the importance of adequate support of the reconstructed breasts by a properly fitting dressing. I have found that a 3-inch Ace or Bender bandage applied over the breasts and around the thorax in a figure eight



will satisfy all the requirements. It holds the breasts up snugly, allows the patient to breathe easily, and will stay in place for a week or ten days, especially if affixed at the edges with strips of adhesive tape running anteriorly upward over the shoulder and then posteriorly downward.

A NOTE ON RACIAL INCIDENCE IN PORTAL CIRRHOSIS

WYMAN RICHARDSON, M.D.*

BOSTON

FOR some time I have suspected that Italians are peculiarly subject to cirrhosis of the liver. In order to verify this impression, the records of all Massachusetts General Hospital ward patients, during the years 1928 to 1935 inclusive, where the diagnosis of portal cirrhosis appeared, were studied. All cases in which there was a reasonable doubt of severe liver disease, as determined by the usual clinical data, were excluded. A total of 48 cases of portal cirrhosis was gathered. Since there were autopsies in only a few cases, no further attempt was made to differentiate the type of cirrhosis, it being practically impossible to do so without pathological examination. However, all cases suggesting the biliary type of cirrhosis, and all cases with positive blood Hinton or Wassermann tests, were excluded.

The racial incidence among these 48 cases in the total hospital population is indicated in Table 1. It will be noted that 19, or 39.5 per cent, of the 48 cases of portal cirrhosis occurred in native-born Italians, whereas this racial group accounted for

only 7.3 per cent of the total hospital population. The incidence of cirrhosis in each of the other groups, including individuals born in the United States of Italian mothers, was lower than that in the total hospital population. Although this is a

Table 1 *Racial Incidence in Cases with Portal Cirrhosis and in the Total Hospital Population*

RACE	CIRRHOSIS NO CASES	INCI- DENCE	INCIDENCE IN HOSPITAL POPULATION
Italian	20		
Born in Italy	19	39.5%	7.3%
Born in U. S. A. (Italian mothers)	1	2%	5.9%
American	9	19%	32.0%
Foreign (other than Italian)	19	39.5%	54.8%
Canadian	4		
German	3		
Irish	2		
Syrian	2		
English	2		
Chinese	1		
Swedish	1		
Polish	1		
Lithuanian	1		
Armenian	1		
Greek	1		

small series of cases, the number of cases among native-born Italians is sufficiently large to be statistically significant.

From the Medical Service of the Massachusetts General Hospital, Boston.
Associate physician, Massachusetts General Hospital.

be used instead of a swathe. The dressing is left undisturbed for one week.

I have, on several occasions, done this reconstruction operation on both breasts at one sitting, but the procedure is long and tedious, taking from three and one half to four hours. With in-

postoperative dressing reduces this hazard. Only once have I found it necessary to evacuate serum through a corner of the incision, and only once was it necessary to drain an infected hematoma.

This type of operation appears to give the best cosmetic result. In some of the other operations

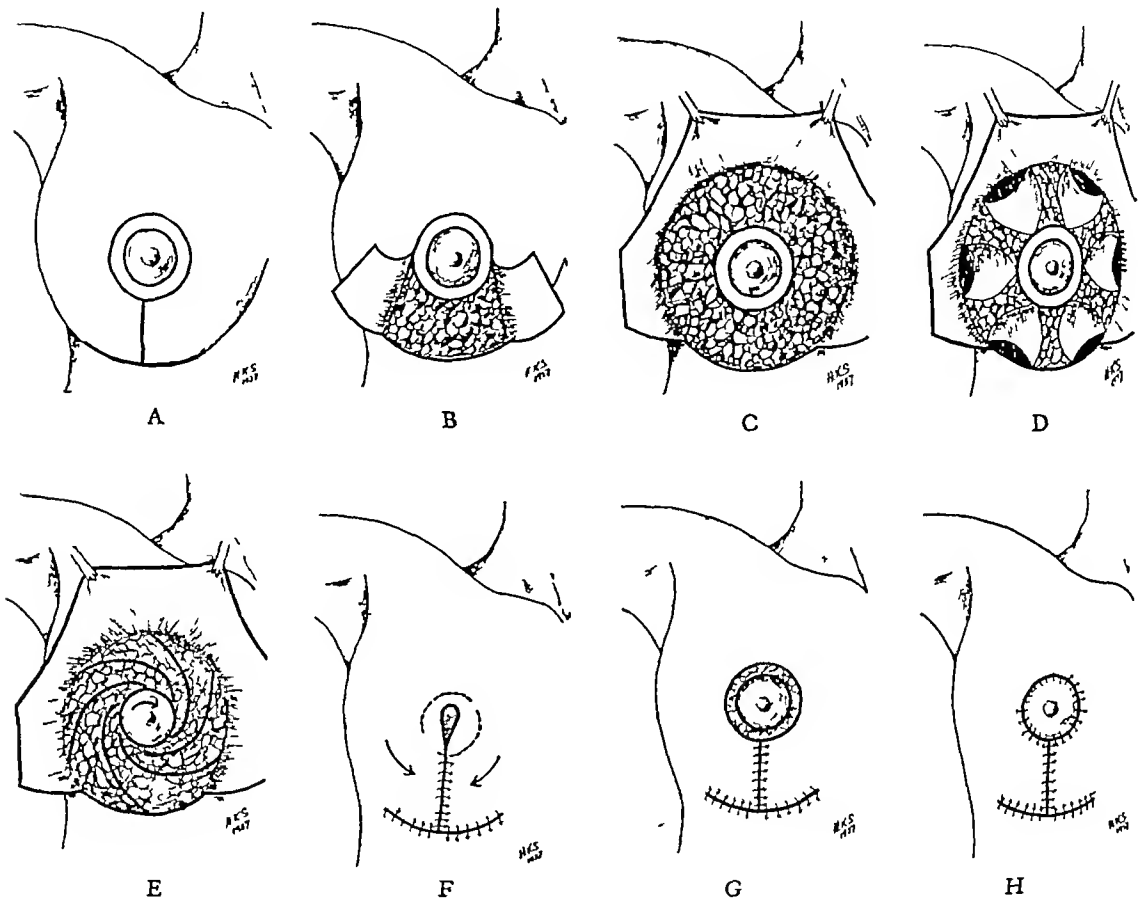


Figure 6

Drawing A shows the skin incision in heavy ink. Drawing B shows the beginning of the elevation of the skin flaps. Drawing C shows the breast entirely uncovered down to the chest wall on all sides. In Drawing D the breast is grasped at the nipple and segments are excised from the edge of the areola to the chest wall. In Drawing E, by rotating the gland, a round conical breast is reconstructed, the folds are approximated to each other with fine silk sutures and the margins of the breast are

sutured to the chest wall, the upper border being held at the level of the second rib, the extra ring of skin around the areola is then excised. In Drawing F, the skin is fitted around the breast from above downward, the excess being cut away in the midline and below. The areola is temporarily covered. In Drawing G the opening for the areola is made. Drawing H shows the appearance at the end of the operation.

creased experience in this procedure, I now advise a two-stage operation, with ten days between the first and second stages. I believe this is safer for the patient and probably reduces the chances of infection, although it necessitates the discomfort of two administrations of anesthesia and a ten-day increase in the hospital stay.

As to complications, the extensive elevation of skin predisposes to collections of blood or serum under the flaps, but care in the application of the

described in the literature, all the tissue is removed from the lower or outer side of the breast. To be sure, this reduces the size and weight, but the end result is a flat type of breast. With the operation described above, the breast is actually reconstructed into a round juvenile type of any desired size, and is then sutured at the correct level to the chest wall.

The question of the possibility of future lactation has been raised. Large, hypertrophied breasts

edly enlarged (Fig 2) and the joint cavity was tense with fluid. A definite mass was palpable over the dorsum of the foot at the astragaloscapoid junction. The circumference of the left ankle was 8.8 cm. greater than that of the right. There was an increase of 6.9 cm. at the mid-tarsal level of the left foot. All motions of the foot and ankle were limited to 50 per cent of normal. There was moderate tenderness on deep pressure and on forced ankle motion. The ankle joint was not unstable, and no grating was perceptible by either palpation or auscultation. The skin was normal in appearance, and there were no signs of infection or of inflammation.

Examination of the blood showed a hemoglobin of 90 per cent, red-blood cells numbered 4,840,000 and the white



Figure 3 *Later x-ray film showing a definite mass on the dorsum of the foot resembling an osteochondroma*

cells 8400. The blood Hinton and Wassermann tests were negative, the urine was negative. The blood calcium was 9.2 mg per cent, phosphorus 4.8 mg per cent, phosphatase 0.51 K units. The spinal fluid was clear, with 4 cells per cu. mm., the pressure and statics were normal, the Wassermann and colloidal gold tests were negative. The Mantoux test was positive at 1:5000. X-rays showed destruction and fragmentation of tarsal scaphoid with proliferation also proliferation of calcaneal epiphysis (Fig 3), the diagnosis was neurotrophic arthritis or atypical Koehler's disease.

The joint was tapped, and about 2 oz. of thick clear fluid was removed. Examination of the joint fluid showed a cell count of 1200. 52 per cent clasmotocytes, 28 per cent monocytes, 16 per cent polymorphonuclears, 4 per cent lymphocytes. Cultures showed no growth. A gonococcal complement fixation test and a Wassermann test were negative. A guinea pig injection was negative for tuberculosis.

At biopsy, a thickened synovial membrane was seen, and a large movable cartilaginous mass was found at the junction of the astragalus and the scaphoid. Portions of the synovium, the mobile mass and joint detritus were removed for study. No indication of infection was present. The pathological report was chronic synovitis, islands of cartilage, some of which are being replaced by bone some new bone formation with fibrosis of the marrow

no evidence of tumor or tuberculosis, no growth on culture.

In order to determine deep sensibility, three rows of intradermal blebs were made with 1 per cent novocain from the mid left leg down and over the ankle and foot. One row was anterior, and the others were somewhat medio-posterior and lateroposterior. After superficial anesthesia was obtained, a sharp-pointed needle was passed through each bleb into the deep tissue. The charted results showed a definite decrease in deep sensibility, beginning at the level of internal malleolus and extending over the ankle and foot to the level of the base of the metatarsals. Deep insensibility to pain was nearly complete, but the patient felt definite deep-pressure sensation upon needle insertion. The reactions of the right foot and ankle were normal as checked against two controls. These changes in sensitivity may have been caused by chronic distention of the capsule and synovium. As a rule, little deep pain is complained of by patients when having a distended joint aspirated.

In order to substantiate the impression that the condition was caused by persistent trauma to an unprotected insensitive joint, the joint fluid was aspirated and measurements of the ankle were recorded. A Boehler walking cast was applied, and upon its removal 5 weeks later further measurements were made. There was a decrease in the circumference at the level of the scaphoid of 3.8 cm. This evidence was supported when the patient secured permission to return to school for 10 days with the ankle unsupported. He returned at the end of that time with the joint filled with fluid.

The neurological examination was essentially negative. No stigmas of hereditary degenerative diseases of the nervous or skeletal system were found. The joint was neither painful nor abnormally mobile. This may have been a neurotrophic joint, but the absence of neurologic abnormalities elsewhere is against it. The staff concluded after a study of the x-rays and clinical evidence that the condition was one of degenerative fracture of the scaphoid, with subsequent proliferation and displacement of the astragalus.

In a familial neuropathy study the blood serologic tests, spinal tap and neurological examination of the mother were negative. The previous hospital records of a brother were negative for any central nervous-system complications.

On summing up the information concerning this patient, one feels confident that the condition was neuropathic. Yet confirmation by positive serologic or neurologic changes is desirable, it not essential, for a definite diagnosis. The question remains, Just when is an apparently neuropathic joint sufficiently neuropathic to warrant a final diagnosis as such?

In an effort to avoid an untenable diagnosis we carefully considered a thorough differential. Since within the astragaloscapoid joint—as noted at biopsy, it was not separated from the ankle joint proper—there was a movable mass, diseases which produce such a lesion was considered. Osteochondritis dissecans and osteochondromatosis were ruled out by x-rays and by examination of the joint and its tissues at biopsy. Chronic infectious arthritis, particularly that caused by the tubercle bacillus, could not be considered in the light of the sterile fluid, lack of inflammatory reactions, and negative

It is difficult to account for this apparent racial tendency to develop portal cirrhosis. One naturally associates the disease with the prolonged, though not necessarily excessive, use of alcoholic beverages, and the Italian habit of drinking a peculiar type of red wine may be a possible etiologic factor. The fact that all but one of the patients

were born in Italy is interesting, for undoubtedly the drinking habits of the group born in the United States of Italian mothers are quite similar to those of the Italian-born group. Possibly the former have not yet reached the age when cirrhosis is likely to occur.

264 Beacon Street.

AN UNUSUAL CASE OF PAINLESS SWELLING OF THE ANKLE

RUSSELL F. SULLIVAN, M.D.,* HAROLD M. CHILDRESS, M.D.†

BOSTON

PAINLESS swelling of a joint caused by tabes dorsalis or syringomyelia is not infrequent but when a similar joint lesion occurs without demonstrable neurologic or serologic changes, the condition may be classed as a rarity. Interest in this case centers not only upon the pathologic changes in the joint and the primary and secondary factors producing it, but also upon the making of a definite diagnosis. The question arises whether one is justified in calling such joints neuropathic if other evidences of neural lesions cannot be found.

CASE REPORT

The patient, a white male, aged 16, was seen at the Boston City Hospital, November 3, 1936, and complained of painless swelling of the left ankle. He stated that in

x rays showed a questionable old fracture of the scaphoid with proliferation. He refused further treatment when he was advised to enter the hospital for complete examination. For the next 6 months, he said, he attended school as usual and had no pain in the ankle, but the swelling remained about the same. On February 17, 1936, he was admitted to a local hospital and was subjected to thorough study. Two examiners from the neurologic staff found a diminished sensation to heat, cold and pain over the superficial distribution of peroneal nerves on the left, and to some extent on the right. They decided that this indicated syringomyelia. The patient was discharged 6 weeks later with that diagnosis, and with an arch support for the left foot.



Figure 1. X-ray film taken shortly after the original injury and showing a lesion in the vicinity of the scaphoid, which was diagnosed as a possible fracture.

mid August, 1935, he had sustained a slight injury to the ankle when he vaulted over a 5-foot fence. It became swollen, but he was able to walk with only moderate discomfort. The day following the injury he attended the outpatient clinic of this hospital, when x rays were taken (Fig. 1) and the ankle was strapped with adhesive. The



Figure 2. Appearance of ankle approximately fifteen months after injury.

This support was discarded in a few weeks. He stated that until his admission, approximately 15 months from the date of injury, he had been performing his usual duties at home and at school without discomfort. The affected ankle, however, had become more enlarged during the last 4 months, and he had been aware upon walking of a vague sensation in that joint.

There was no family history of tuberculosis, cancer or insanity. The patient's health had always been good except for measles, mumps and chickenpox in childhood. On physical examination the left ankle appeared mark-

From the Bone and Joint Service, Boston City Hospital.
Read before the Boston Orthopedic Club on February 8, 1937.
Junior visiting surgeon, Bone and Joint Service, Boston City Hospital.
†Former resident, Bone and Joint Service, Boston City Hospital.

patients who were treated by splinting, by full protection and later by physiotherapy made complete recoveries. Philips and Rosenheck¹⁴ report in 2 patients three apparently neuropathic joints which appeared after localized trauma. In each case the usual progressive neuroarthropathy was found despite the absence of any positive blood, spinal fluid or neurologic changes. One patient, an ice carrier, sustained a severe strain of his shoulder. The man was dissatisfied with conservative treatment and went to another hospital, where a biopsy gave a negative report for tumor. Later his other shoulder showed a slight but similar affection, but both joints reached a quiescent stage and he was able to work without discomfort or mechanical handicap. He was observed for over two years. The other case was that of a lumberyard worker who had a history of trauma of the shoulder joint. He had a neuropathic joint filled with sterile fluid. He also responded to conservative treatment, and the swelling and disability gradually decreased over the ten months of observation. These authors point out that Virchow found and reported such joint changes following peripheral nerve lesions, but that he received no credit for this discovery. They conclude that the explanation may be the result of a certain type of injury upon a peculiarly constituted individual who is disposed to such a condition.

That the lesion is rare is shown by the report by Key¹⁵ of 69 cases diagnosed as having neuropathic joints, all of which were proved to be definitely tabetic. Steindler² writes of 64 cases of which all but 2 were tabetic, these presumably being caused by syringomyelia. Campbell¹⁶ says that he has seen many patients in whom the brachial plexus has been injured, severed or avulsed but that in no case did such a joint develop. Others state that they have never seen this syndrome with peripheral nerve injuries. Milgram³ sums up the situation by asserting that if neuropathic joints do occur after such peripheral nerve trauma they must be extremely rare. According to him, analysis of most case reports shows that there have often been avulsions and tears of the cervical or dorsal roots, which might well be attended by associated injuries to the spinal cord. Philips and Rosenheck¹⁴ state that the condition may be a new clinical entity, that it is apart from the usual neuropathic joint, and that it occurs more frequently than is generally believed. They emphasize the importance of its recognition in the diagnosis and treatment of industrial injuries.

Codman¹⁷ agrees that in the patient here considered the neuropathy antedated the actual injury noted in the history and that thus the tarsal

bone must have been so predisposed. The loss of the sensory afferent fibers allowed the joint to become indolent, vulnerable to trauma and unable to compensate in case of injury. As noted in the early x-rays by the increased density of the calcaneal epiphysis and by the amount of destruction and proliferation of the scaphoid, one must conclude that so extensive a condition would not have been produced in three weeks. There is also a marked increase in inorganic salts in the other tarsals. Thus, unnoted by the patient, an insensitive left ankle joint must have been in existence for several weeks or months before the recorded trauma was received. It is well known that increased fragility of bone occurs in a neuropathic joint, and that of the tarsal bones the scaphoid is the most frequently affected. This is because of its exposure to such heavy pressure and strains in ordinary walking. From this fracture and subsequent fragmentation of the scaphoid there resulted such an imbalance in the usual weight-bearing lines that a defensive reaction was produced. This increase in size of both the distal tibia and fibula is common in neuroarthropathies, and Potts¹⁸ has given it the name of parosteal bone.

That the lesion was progressive is shown by the two x-ray plates, and that it was caused by the constant traumatization to an unprotected joint is shown by the marked improvement in the joint upon its being protected by the walking iron. That the neural mechanism is disturbed is evidenced by the slight pain present, which is not commensurate with what one would normally expect with such an extensive lesion. Eloesser¹⁹ has produced similar neuroarthropathies in cats by traumatizing the joint after he had severed the sensory fibers leading to the legs. The joint fluid is caused by a traumatic synovitis, and the partially loose bodies in the joint are pressed-out osteophytes, forming islands of bone in varying stages of development in the synovial folds and on the exposed articular surfaces.

The x-ray plates were seen and the facts of this history discussed by the staffs of one Boston and two New York hospitals. The roentgenologists made a positive diagnosis of neuropathic joint, the neurologists were inclined to defer final diagnosis until confirming evidence of some known neurologic factor was presented, the pathologists were unwilling to make further comment, other than that the joint showed chronic synovitis, with concurrent bone destruction and repair, the orthopedists called the joint neuropathic, advocated treatment by adequate splinting and protection, but preferred to have the condition linked with some recognized neuropathy.

results from guinea-pig injections. An atypical osteochondritis juvenilis of the tarsal scaphoid followed by its fragmentation, thereby creating a static imbalance in weight-bearing, was given credence when 2 painless cases of tarsal osteochondritis were found reported by Buchman¹. But the x-ray plates made three weeks after injury show such extensive combined bone destruction and reparation at the astragaloscaphoid joint and in the scaphoid that in no way could the condition be classed as Koehler's disease. The finding that absence of pain with such a lesion is indicative but not pathognomonic of neuropathic joints made the situation more confusing. Steindler² reports 16 out of 99 neuroarthropathies which had varying degrees of pain. Milgram³ also states that deep-tissue insensibility to needle puncture is not a constant finding in neuropathic joints, and that the occasional infection subsequent to biopsy is almost invariably accompanied by pain in that area.

Granting that the condition is typically neuropathic—which it apparently has been from the start to the present time—one is confronted with the necessity of explaining the neuropathogenesis. Mitchell⁴ in 1831 first described such joint lesions, but it remained for Charcot⁵ thirty-seven years later to make it a clinical entity by his complete description and his association of it with tabes dorsalis. During and immediately after the Civil War cognizance was given to the fact that traumatic injuries to the spinal cord or to nerve roots could produce exactly the same clinical and pathologic changes as those seen in a Charcot joint. To show the progress of this study since then and to apply it to this case, we give below the classification of neuropathic joints by Shands⁶. He places tabes dorsalis and syringomyelia in separate groups, as they are the causative factors in practically all cases.

- 1 Tabes dorsalis
- 2 Siringomyelia
- 3 Following lesions of the cerebrum
 - Dementia paralytica
 - Hemiplegia following hemorrhage.
- 4 Following lesions of the spinal cord
 - Injury
 - Congenital malformation
 - Tumor
 - Tuberculosis of spine.
 - Acute myelitis and anterior poliomyelitis
 - Progressive (central) muscular atrophy, etc.
- 5 Following lesions of peripheral nerves
 - Injury
 - Peripheral neuritis
 - Leprosy

In this patient one can eliminate cerebral lesions, and with the exception of trauma, all spinal lesions. Complete spinal plates at two hospitals

were interpreted as negative for either congenital or developed malformations. In considering the peripheral nerve lesions one may reject leprosy and peripheral neuritis by reason of the history and the clinical findings. There remain but the cord and peripheral lesions caused by trauma or by unknown or concealed factors. It is logical to consider only the peripheral nerve lesions, since the area of partial deep sensibility following trauma is sharply limited to the ankle and foot.

The first case of joint changes subsequent to peripheral nerve lesions was reported by Packard.⁷ Mitchell⁸ wrote of a patient who developed excessive joint changes after dislocation of the humerus. McArdle⁹ mentions that arthritic changes may appear when a nerve to that joint has been pierced, rubbed, lacerated or otherwise subjected to trauma or irritation. It is known that atrophy of bone and soft tissue always occurs when a nerve is completely severed, but it is significant that neuropathic joints following pressure on the sciatic nerve by bone tumors have been reported. Wile and Butler¹⁰ write of a patient who developed a typical neurotrophic joint following acute arthritis, no serologic or neurologic changes accounting for the condition were found. Shands⁶ reports a neuropathic ankle which occurred several years after an injury to the lower leg, on dissection the distal portion of the posterior tibial nerve was found to be surrounded by cicatricial tissue. He concludes that the scar formation in some manner blocked the sensory fibers leading to the joint but left the motor branches unaffected. Bennett and Hinricson¹¹ note a case of a neurotrophic ankle from the joint fluid of which tubercle bacilli were isolated. They state that the sensory nerve endings must have been adversely affected, and that this left the joint structures without adequate protection. Cases following alcoholic neuritis have been reported, and others secondary to injuries to the posterior nerve roots. Duncan¹² records a painless swelling of a lumberman's wrist which appeared soon after his shoulder had been injured by a falling log. This patient also had sensory changes through his entire arm and shoulder, which indicated that the posterior roots or even the cord had been injured. Another common etiologic factor is trauma at or near the affected joint.

Cotton¹³ tells of seeing several cases of so-called traumatic arthritis accompanied by swelling, and with slight to moderate pain, which upon arthroto-my revealed a joint cavity filled with detritus. This condition is in his opinion closely related to osteochondritis dissecans, but the histology and the macroscopic appearance of the loose bodies and the evident destructive and reparative processes in the joint indicate rather a neurotrophic condition. He states that after removal of the joint debris the pa-

fied by any notation of fluid in the abdomen or chest. In 1913 Titus,⁴ of Boston, in discussing fibroma of the ovary, stated that ascites was an accompaniment in about half the cases. The following year Fullerton⁵ discussed fibroid tumors of the ovary and commented on the frequent early occurrence of ascites. Hellman⁶ in 1915 reviewed the literature and found abdominal ascites in at least 5 per cent of all cases of ovarian fibroma, distinctly less than Titus's 50 per cent. Hellman presented 2 cases of his own which showed ascites. Reel⁷ in 1917 reported ascites in the presence of ovarian fibromas, Saint,⁸ of Edinburgh, in 1919 also found ascites in the presence of a single ovarian fibroid. Richardson,⁹ of London, presented a pathologic specimen of fibroma of the ovary which had been accompanied by ascites. In 1920 Clark and Gabe¹⁰ reviewed the literature and noted the work of Coe in 1882 and of Hellman in 1915. They placed considerable diagnostic value on the presence of fluid in the abdominal cavity. In 1922 Macdonald¹¹ reported ascites accompanying ovarian fibromas.

Not until 1923 do we find any mention made of pleural effusion in the presence of ovarian fibroma. Owen¹² asserted that hydrothorax might occur with ascites. Hoon,¹³ reporting from the Mayo Clinic reviewed all their cases of ovarian fibroma from 1910 to 1921. Out of a total of 4175 tumors of the ovary, he found 55 cases in which the mass was removed at operation and which showed no other pathologic condition. There were in addition 94 fibromas associated with other lesions. Hoon ventured the surmise that the ascites present might be due to peritoneal irritation. Two of his patients also had bilateral hydrothorax, which disappeared after operation. No mention of pleural effusion was made by Likes¹⁴ in 1935.

In the majority of textbooks ovarian fibromas are either ignored or mentioned only in passing. In Crossen's¹⁵ *Diseases of Women* the author devotes only five lines to ovarian fibromas. He states that all solid tumors of the ovary are rare and comprise only about 5 per cent of all ovarian growths coming to operation. In the second edition of Curtis's¹⁶ textbook, discussion of these tumors occupies but seven lines. This author states "Less than 200 cases are recorded in the literature, but inquiry indicates that this is not a true index of their frequency." In Davis's¹⁷ *Gynecology and Obstetrics*, one fourth of a page is given to fibromas along with fibromyomas and myomas of the ovary, and all are classified as relatively uncommon growths. Meigs,¹⁸ in his excellent book *Tumors of the Female Pelvic Organs*, devotes four pages to this particular tumor.

Much credit is due to Meigs and Cass¹⁹ for

emphasizing the syndrome of ovarian fibroma, ascites and pleural effusion, for although it has been recognized that ascites exists very frequently with fibromas of the ovaries, only very recently has the presence of hydrothorax accompanying these tumors been detected. In 1936 they reported a series of 7 cases of fibroma of a single ovary with fluid in the abdomen and in the chest. Four of these were from the Massachusetts General Hospital, 2 from the Mayo Clinic and 1 from the literature.

In all these cases the surgical removal of the fibroma proved to be the only step necessary to relieve the patients of ascites and pleural effusion. The reason for the fluid was neither known nor explained, nor was it at all clear why the removal of the tumor cured the condition. One ovary, never both, was involved, and the right chest was more often involved than was the left. Guinea-pig inoculations with the chest fluid were negative for tuberculosis, and cardiorenal disease was absent. Simple removal of the tumor produced a cure. Thoracic and abdominal paracenteses did not relieve the condition in the least. The entity was found to progress rapidly up to the time of operation.

We wish to report 2 cases, one a unilateral fibroma, the other bilateral and containing a papillary cyst in one ovary, in addition to the fibroma.

Case 1 • E. B., aged 50, a white, married female, was admitted to the gynecological service of the Hartford Hospital on September 15, 1936, complaining of progressive enlargement of the abdomen of 6 weeks' duration, and of difficulty in voiding for a relatively short time. During the previous 6 weeks she had experienced lower abdominal pain, characterized as a heavy, dragging sensation. The former history was unimportant. Menopause occurred 10 years prior to admission, and since then there had been no bleeding.

The positive findings on physical examination were a general appearance of illness, two lipomas on the back, signs of fluid in the right posterior chest, slight enlargement of the heart to the left, an elevated pulse rate, and a pelvic mass rising to the umbilicus, which gave the findings compatible with encapsulated fluid. Roentgen examination of the chest was reported as follows: "Stereoscopic and lateral examination of the thorax shows a moderately large amount of fluid in the right pleural cavity, extending into the interlobar fissures and apparently encapsulated in the axilla. The possibility of an underlying pathologic change in the right pulmonary field cannot be excluded without further examination made after a thoracotomy." The left lung is negative in appearance.

An operation was performed under spinal anesthesia 3 days after admission. A lower midline incision was made. The abdomen was filled with blood-tinged fluid. A solid right ovarian tumor, with loops of bowel adherent to the tumor mass, was visualized. The liver was smooth, and normal to palpation. The gall bladder was negative.

Reported through the kindness of Dr. G. E. Howe, on whose service at the Hartford Hospital the case occurred.

SUMMARY

1 A case of a typical neuropathic ankle joint, without demonstrable serologic or neurologic changes except partial insensibility of local deep tissues, is presented

2 Such painless swelling following trauma is indicative but not pathognomonic of a neuroarthropathy

3 The condition was caused by an unknown neural lesion, probably peripheral and perhaps traumatic in origin

4 The joint lesion resulted from repeated trauma to an insensitive unprotected joint

5 Prognosis is uncertain until the primary cause is found

6 The differential diagnosis of this presumably neuropathic joint condition and similar joint changes caused by known neuropathy is discussed

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FIBROMA OF THE OVARY WITH ASCITES AND PLEURAL EFFUSION

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INTEREST in ovarian tumors has increased during recent years, and has necessitated a reclassification of ovarian embryology and pathology according to modern concepts. We should no longer speak of cancer of the ovary or sarcoma of the ovary, but must differentiate the type of carcinoma by its predominating cell structure and embryologic anlage. Primary tumors of the ovary are not uncommon and may be varied. This must be self-evident to anyone who reviews the complex structure of the ovary—an epithelial covering, the so called germinal layer, a tunica albuginea, a thickened connective-tissue coat beneath the epithelium, a cortex containing the primordial follicles, a medulla containing a few tubular rests from the developmental anlagen and a connective tissue stroma reaching from the cortex to the hilum and attached to the mesentery or mesovarium. In addition, there are numerous and tortuous blood vessels, lymphatics extending from cortex to hilum through medulla, and nerves accompanying the ovarian artery. With this renewed interest in ovarian tumors there have been discovered in the body other pathologic conditions existing simultaneously with these tumors and apparently caused by them.

We are particularly interested in a definite syndrome ovarian tumor, with ascites and pleural effusion. To those unfamiliar with this combination it means malignancy. In Kelly's¹ Gynecology one finds this statement: "Fibroma is among the rarest of pelvic tumors, and is characterized by an indefinite multiplication of all the connective tissue elements of the ovary at the expense of the other histological components. The mass thus becomes a fibroid ovary which may further contain degeneration cysts, dilated blood spaces, and lymph spaces." In the first 10,000 gynecological admissions to the Johns Hopkins Hospital he recorded 10 cases with large fibroid ovaries and 3 with small calcified tumors, an incidence of 0.13 per cent. Ascites was frequently present.

Reviewing the English and American literature we find that ovarian fibromas comprise a small percentage of all ovarian tumors, ranging in different clinics from less than 1 to 4 per cent, and probably averaging 2 per cent. There are several reported cases where abdominal ascites was noted. Boldt² in 1910 reported a case of fibroid tumor of the ovary with ascites. In 1909 Mapes³ reported a similar case, and presented a review of the literature as far back as 1840, in this review he found 71 cases of fibroma not qual-

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in any part of the peritoneal cavity, nor was there any evidence of extension of the tumor masses to the bowel. There were no bowel adhesions. Each tumor apparently arose from an ovary (Fig 2). Grossly the tumors appeared smooth and nodular, on section they were com-

positioned in the chest taken November 30, 3 months after operation, showed no evidence of pleural effusion (Fig 4).

SUMMARY AND CONCLUSIONS

There is a definite syndrome of ovarian fibroma, ascites and pleural effusion which has only very recently been recognized. Two such cases are described. The cause of the fluid and the reason why removal of the ovarian tumor effects a cure remain unexplained. Many of these cases may be found on medical wards. Internists considering causes of chest fluid and ascites should be aware of the condition, as should surgeons and gynecologists considering the possibility of a malignant tumor with metastases to the chest. Usually but one ovary is involved, but both may be, as noted in a case reported herewith. The cure is surgical removal of the tumor. Irradiation therapy is unnecessary.

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Figure 4 Normal roentgenogram of chest three months after operation

posed of dense gray strands of fibrous tissue. Microscopic sections of the solid tumors showed typical fibromas, no anaplasia and no malignancy (Fig 3). In one or two areas the pathologist reported the cells to be somewhat large and slightly hyperplastic. The cyst was lined by low epithelium, which in focal areas was thrown into a papillary arrangement. Here again there was no evidence of malignancy.

The patient had an uneventful convalescence and left the hospital on the 17th postoperative day. X-ray exam-

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There was no sign of malignant metastases. The uterus, left tube and ovary appeared normal. Only the tumor was removed.

The pathological report (Dr. Kendall) was as follows: 'Gross: Nodular mass 15 by 12 by 11 cm., encapsulated. On section, it is composed of interlacing strands of rather soft fibrous tissue, through which there are extensive interstitial hemorrhages and dilated vessels. Over one surface is what appears to be a vessel containing blood clot. At one pole of the nodule there is a cyst 3 cm. in diameter, having a ragged, seminecrotic lining. Microscopic: Multiple sections through the nodule show a rather cellular fibrous-tissue proliferation. There are some mitotic figures, a few are not entirely regular. There are extensive areas of myxomatous degeneration, and large vascular spaces are scattered through the tissue, in some of which thrombi are present. Structure is fairly characteristic of a benign fibroma of ovarian stroma. Diagnosis: Fibroma of ovary.'

The patient was discharged on the 19th postoperative day, after an uneventful convalescence. An x-ray of the chest at that time showed less fluid than prior to operation. An x-ray of the chest 7 months after operation showed no evidence of effusion.

Case 2. I. U., aged 55, a white female, was admitted to the gynecological service of the Municipal Hospital, Hartford, on August 21, 1936, complaining of swelling of the abdomen. About 2 months prior to admission she



Figure 1 Roentgenogram of chest before operation, showing pleural effusion

first noticed the swelling. She also complained of pain in both kidney regions and a low sacral backache. There was a history of chronic constipation. The menopause had occurred at 35. The past history was unimportant, except for hospitalizations for glaucoma of the eye and for strangulated hernia. Examination revealed bilateral cataracts, a few coarse rales at the right lung base, with diminished breath sounds over the same area, a blood pressure of 112/68, the abdomen shiny and taut with presence of a fluid wave and a right inguinal hernia in addition to the old herniorrhaphy scar in the same region. Vaginal examination showed a large, hard, irregular mass filling the pelvis, reaching to 2 fingers below the umbilicus, im-

movable, with tenderness in the region of the sigmoid and rectum. The mass filled the posterior cul-de-sac.

X-ray of the chest the day after operation showed no evidence of tuberculosis, but there was increased density at the outer and lower portions of the right lower lobe, with irregularities of the diaphragm and partial obliteration of the costophrenic angle, all indicative of pleural exudate (Fig. 1). The blood Wassermann and Kahn tests

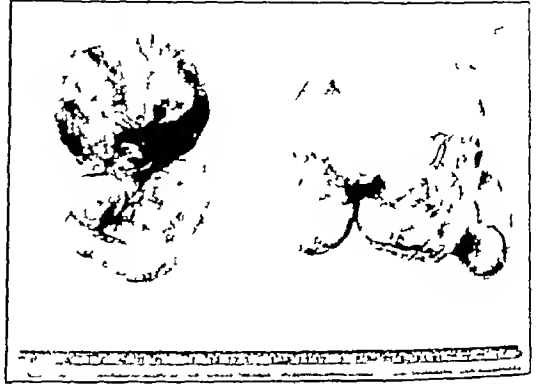


Figure 2 Fibromyomas of both ovaries, papillary cyst of ovary

gave a 2+ reaction. The blood nonprotein nitrogen was 35.9 mg. per cent. The red blood-cell count was 4,030,000 with 85 per cent hemoglobin.

At operation about 3500 cc. of straw-colored fluid was removed from the peritoneal cavity by suction. A solid ovarian tumor 9 cm. in diameter, together with a multilocular cyst, was removed. The lower pelvis was then found to be filled with another ovarian tumor, so situated as to give rise to sigmoidal and rectal obstruction, it was

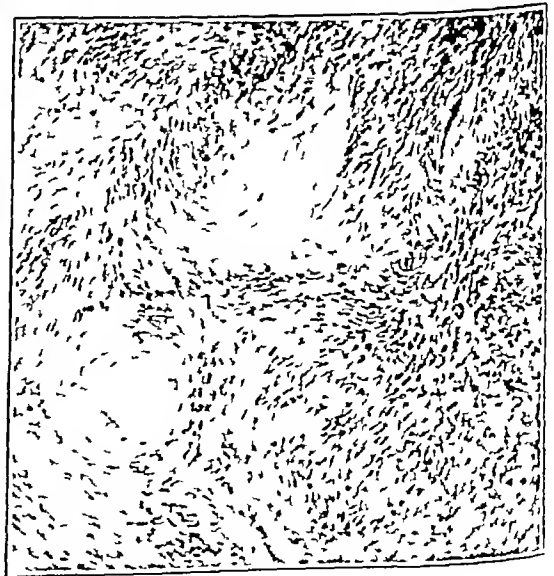


Figure 3 Photomicrograph of ovarian fibroma

delivered from the pelvis with some difficulty and was removed. Both tubes and the uterus down to the cervix were then removed by the usual procedure followed by a supracervical hysterectomy. No lymph nodes were found

anotic man propped up in bed, in obvious distress. There were moderate dulness and moist rales at both lung bases. The heart was essentially the same as on previous examination, and the blood pressure was 140 systolic, 80 diastolic. The abdomen was distended with fluid, liver and splenic dulness were increased, and there was marked edema of the legs, sacrum, scrotum and hands.

The temperature was 99.4°F, the pulse 84. The respirations were 36.

The urine contained a trace of albumin. The white-cell count of the blood was 11,000. The blood nonprotein nitrogen was 37 mg, and the protein 4.9 gm per cent.

An electrocardiogram taken on the fifth day showed a rate of 133 with sinoauricular tachycardia, depressed S-T₁ and S-T₂ intervals, inverted T₁, low diphasic T₂, practically flat T₃ and flat T₄. Q₃ was present, Q₄ short. The P waves were poorly marked, and S₁ was prominent. The QRS complexes were slightly slurred, and there was slight right-axis deviation.

In spite of digitalis, ammonium chloride and salyrgan therapy he failed to show any improvement. He died on the sixth day.

DIFFERENTIAL DIAGNOSIS

DR JAMES H. MEANS: This is a rather unusual story of rapidly decreasing cardiac reserve over an eighteen-year period in a man who was seventy-one years of age at the time he came under observation. We observe these symptoms of increasing dyspnea related to effort and the gradual development of orthopnea. We note edema which is clearly present at first only when he is upright, disappearing at night, and finally we are told of the development of a considerable degree of generalized cardiac edema which persists and gradually ascends his legs. It seems to me that the edema in the early part of this story is rather more than one would expect solely on the basis of cardiac insufficiency. We know he had some ulcers on the lower legs and are therefore inclined to think there was another factor, namely varicose veins, with secondary varicose ulcers. The cardiac patient with varicosities will get edema more quickly than one who has no varicosities. I am impressed with the story of repeated attacks of bronchitis. He has them over and over again. We learn that he has paroxysms of coughing, possibly fever, and finally we are told that he has attacks which resemble asthma, so we are justified under the circumstances in supposing they are so-called cardiac asthma, and a manifestation of heart failure. On the historical data alone one would be entitled to say that he has cardiac failure which involves both sides of the heart.

When we come to the physical examination, we are told that he is well developed — indeed we are told that he has gained 26 lb, bringing his weight up to 220, so he was an obese subject anyway. We do not know the cause for this gain in weight. It may have been dropsy, but it occurred at a time when he was still able to get about. It is unusual for a man to gain 26 lb from dropsy and still be able to continue with work, but it is possible.

Here is a man then with a large heart, with a systolic but no diastolic murmur. He is described as being short of breath and having cyanosis. No mention is made of the size of the liver, and there is nothing about dilated veins in his neck, so we may assume that the liver is not enlarged and that the veins are not dilated. He apparently has a right hydrothorax and some edema in his left lung.

He is afebrile, from the urinary and blood findings there is no evidence of any disease. He has no azotemia. The protein of the blood is within normal limits. The sedimentation rate is a little high. All I can get out of the electrocardiogram is right axis deviation. For further interpretation I shall be obliged to depend on the cardiologist. Perhaps someone will speak about that later.

I might say that the laboratory and physical findings check with the history and indicate that this man is suffering from some kind of heart disease, with congestive failure and consequent anasarca. His response to digitalis is further evidence that he has congestive heart failure. It is interesting that the pulse rate is the same on his second entry as on the previous entry. Although we do not know whether he was digitalized on the first entry, we assume that he was not. This time he is, but the pulse rate is identical. The respirations are more rapid than previously.

No mention is made of x-ray studies.

DR TRACY B. MALLORY: None were made.

DR MEANS: Might I have the help of the cardiologist on the electrocardiograms if he does not tell me the diagnosis?

DR MALLORY: I think that would be in order.

DR EDWARD BLAND: The first electrocardiogram is consistent with a man of his age, except the right-axis deviation. The T waves are suggestive of a digitalis effect. We do not know whether he was getting it at the time of the first entry. The second electrocardiogram showed a rapid rate, depressed ST₁ and ST₂ and probably represents a digitalis effect. A flat T₄ also suggests digitalis. Here again he had slight right-axis deviation without definite intraventricular block. That suggests a little more than the normal findings in a man of seventy-one.

DR MEANS: It seems obvious that he died of congestive heart failure. The only question is, What kind did he have? The way to approach

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24061

PRESENTATION OF CASE

First Admission A seventy-one-year-old, white toolmaker entered the hospital with the complaint of gradually increasing dyspnea of eighteen years' duration.

About twenty-five years before entry he had an attack of bronchitis followed by "blood poisoning" in his hand which remained localized. Shortly after that he noticed occasional swelling of his ankles, especially when he stood for a long time. Eighteen years before entry he began to notice dyspnea on exertion and more frequent swelling of his ankles. The swelling always disappeared during the night. During the next thirteen years the symptoms gradually became more marked, and he had recurring head colds and attacks of bronchitis. About five years before entry he began to use two pillows at night. He became dyspneic on moderate exertion, and his ankles were swollen every night. Two years before entry he slowly gained about 26 lb until his weight reached 220. He said that there was no increase in his appetite or change in his eating habits. One year before entry he had a severe attack of bronchitis, and for the first time it was necessary for him to stop work. At that time the edema of his legs had become quite marked, and he developed ulcerations of his lower legs. He remained at home for seven weeks, and then returned to work. His dyspnea had become so marked that he had considerable trouble climbing one flight of stairs, and he had an almost continuous cough, productive of small amounts of mucoid sputum. Six months before entry he noticed edema of his scrotum and slight swelling of his abdomen. Two months later he had another attack of bronchitis with paroxysms of coughing and questionable fever. He stayed in bed for two weeks because of weakness, and after that was unable to return to work. His physician gave him digitalis, which failed to bring about much improvement. During the four months before entry he had nightly attacks of "asthma" which lasted for about half an hour and subsided spontaneously. On several occasions it was necessary for him to spend the night in a chair in order to get any sleep.

One sister died of "dropsy" and one had "dropsy" at the time the patient entered the hospital. His family history was otherwise negative, and his past history was noncontributory.

Physical examination revealed a well-developed man breathing rapidly, with cyanosis of his lips and nailbeds. The lungs showed dullness to flatness at the right base with absent breath sounds, voice sounds and tactile fremitus, and a few fine moist rales at the left base. The heart showed general enlargement with the left border of dullness 13 cm from the midline. The sounds were of poor quality, and A_2 was equal to P_2 . There was a loud systolic murmur at the apex, transmitted to the sternum and axilla. The blood pressure was 140 systolic, 80 diastolic. There was obvious fluid in the abdominal cavity. The subcutaneous tissue of the abdomen, genitalia and legs was edematous.

The temperature was 98.6°F, the pulse 80. The respirations were 25.

The urine had a specific gravity of 1.025 and contained rare hyaline and granular casts. The blood showed a red-cell count of 5,250,000 with 80 per cent hemoglobin, and a white-cell count of 7600, 59 per cent polymorphonuclears. The stool examination was negative. The blood Hinton test was negative. The nonprotein nitrogen of the blood was 28 mg, and the protein 5.9 gm per cent. The sedimentation rate was 0.52 mm per minute.

An electrocardiogram showed a normal rhythm, inverted T_1 and T_2 , low and upright T_3 , and upright T_4 . Q_4 was present, S_1 prominent. The S-T intervals in Leads 1 and 2 were depressed. There was a slight tendency to low voltage and right-axis deviation.

He was treated with large doses of digitalis and with salyrgan, and in three weeks all evidence of cardiac decompensation had disappeared. There was still moderate edema of the legs, particularly on the left, but this was thought to be due to varicose veins or an old phlebitis. He was discharged on the thirty-second day on a digitalis and theobromine regime with Bender bandages for his legs.

Final Admission (six weeks later) After discharge he continued to be dyspneic even on slight exertion, and soon noticed that in spite of exercises, bandages and elevation of his legs the edema began to reappear. His physician took him off digitalis and gave him another medicine which he said contained digitalis. During the two weeks before re-entry he became very orthopneic, the edema spread up to his hips, and he felt very weak and tired.

Physical examination revealed a dyspneic, cy

thing or failed to appreciate the significance of some fact given in this record—we usually do that. There are various fantastic diagnoses that one could indulge in. Dr Mallory once produced a tumor of the heart that gave congestive failure, but I will not enter into any such speculation as that.

DR. MALLORY I should like to raise the question of senile calcified aortic stenosis.

DR. MEANS I suppose I should have thought of that, but there is no mention of a murmur that in the slightest degree suggests aortic stenosis. I cannot make a diagnosis of aortic stenosis without a basal systolic murmur and thrill.

DR. MALLORY He had a systolic murmur.

DR. MEANS It was at the apex and transmitted to the axilla.

DR. MALLORY I mentioned that merely because of all the valvular heart disease we see in this hospital that is the one most frequently missed.

DR. MEANS Is that what he had?

DR. MALLORY No.

DR. JOHN H. TALBOTT I should like to ask a cardiologist if it is possible for a congenital pulmonary stenosis to be asymptomatic until the man was well along in years.

DR. MEANS I did not mention congenital lesions. Dr. White had one patient who died of congenital heart disease at an advanced age but he was not so old as this patient.

DR. MALLORY He was fifty-five, but had had symptoms for many years.

CLINICAL DIAGNOSES

Arteriosclerotic heart disease with congestive failure
Pulmonary infarct?
Anasarca
Varicose veins

DR. MEANS'S DIAGNOSES

Pulmonary heart disease (cor pulmonale)
Multiple pulmonary thrombosis
Congestive heart failure
General anasarca
Varicose veins
Phlebitis with resulting pulmonary embolism?

ANATOMICAL DIAGNOSES

Embolism and thrombosis, old and fresh, of many pulmonary-artery branches
Pulmonary infarcts, recent
Cor pulmonale
Anasarca
Pulmonary tuberculosis, bilateral, healed
Arteriosclerosis marked, abdominal aorta, iliac and popliteal arteries, moderate, coronary arteries

Thrombophlebitis old, popliteal veins, recent, inferior vena cava

Benign hypertrophy of prostate

Duodenal ulcer

Diverticula of colon

Rectal polyp

PATHOLOGICAL DISCUSSION

DR. MALLORY I thought it would be interesting to give Dr. Means a test and see if he remembered the case on which he based a paper about ten years ago. This is the most similar case that we have had since. He has presented it so skilfully that he has made it seem easy and obvious, but I should like to call your attention to the fact that cor pulmonale was not even mentioned as a possibility during either of this man's two sojourns in the hospital. This man, instead of having a single huge thrombus obstructing the main pulmonary artery to one lung, had multiple old organized thrombi in the smaller subdivisions of the arterial tree. One of the major branches to the right upper lobe, the major branch to the right lower lobe and the main branch to the left lower lobe were all occluded by old organized and partially recanalized thrombi. In this case there was no compensatory dilatation of the bronchial artery that we made out in gross. There probably was some that could have been demonstrated if anyone had guessed the diagnosis before autopsy as accurately as Dr. Means has and had injected the lungs with proper technic. In this case I do not believe it would have been very great, however, because there was fairly extensive recanalization of most of the thrombi, and a very marked dilatation at the vasa vasorum which anastomosed extensively with the canalizing vessels. In one of the large canalizing vessels within one of the biggest of the old thrombi, we found a fresh thrombus, which I think may be correlated with the acute episode just before he came in the last time. We also found a number of small recent infarcts way out in peripheral portions of the lung. His popliteal veins showed an occlusive process of an age at least equal to that of the older pulmonary lesions. Both had obviously been at one time completely occluded and had become fairly extensively recanalized. In the inferior vena cava we found a fresh thrombus which was probably the source of the final pulmonary emboli. The lungs, except for the vascular change, were in remarkably good condition. There was no evidence of bronchitis or of emphysema. There was some atelectasis as the result of the bilateral pleural effusions and the apices showed old tuberculous scars.

He had a variety of other conditions, none of them apparently of any clinical importance, such

such a question is to consider all the kinds he could have had, and by elimination, see if one can arrive at a correct diagnosis. Did he have rheumatic heart disease? I suppose it is possible. I have a patient, a man of his age, who has rheumatic mitral stenosis, so one can live that long with mitral heart disease. By some remote possibility he might present a picture like this one, but it is extremely unlikely. There is nothing in the previous story to suggest that he had had heart disease prior to this eighteen-year story. The whole course seems unlikely for rheumatic heart disease. The physical findings of a systolic murmur and a heart transversely widened would be consistent with organic mitral regurgitation, but we have no evidence of stenosis, and altogether the picture does not closely resemble rheumatic heart disease. Syphilis, so far as I know, does not run this long. He is too old for it and certainly has had symptoms too long for syphilitic heart disease. As he also had a negative Hinton test, I shall rule out syphilis, although we must recognize that a few patients with negative serologic tests do have syphilitic heart disease. There is no evidence of hypertensive heart disease, and no evidence in the history, physical examination or electrocardiogram that there is anything whatever wrong with his coronary arteries. There is no evidence of myxedema or thyrotoxicosis.

So by exclusion we are almost led to believe that his heart disease must be secondary to some lesion in the lesser circulation and that this is indeed a case of cor pulmonale. It seems to me that this is suggested by several things. In the first place, cyanosis is mentioned, and cyanosis is more striking in older people with pulmonary heart disease, as I have seen them, than it is in people with other types. It is also suggested by right-axis deviation, although we must concede that organic mitral disease may give a similar picture under certain circumstances. Nothing is said in the physical examination about emphysema, but I am very much impressed with this story of repeated episodes of what is called "bronchitis." It seems to me that coincident with this long history of very gradually progressive heart failure something has been going on in the lungs that was called bronchitis and it may have been associated with a certain degree of gradually increasing pulmonary emphysema. The attacks which he had had were called "asthma," and they would fit into such a conception, although of course they might also have been due simply to acute pulmonary edema as a result of left ventricular failure. I do not believe it is possible to say which they were without having the opportunity to observe them.

I do not believe that he has Ayerza's disease, — he

is far too old, — but there are other things that could go wrong with the pulmonary circuit.

I am reminded very much of a case that I had in the Phillips House a number of years ago that Dr. Mallory did an autopsy on and that we reported together. The man was not so old as this one. He came in with heart failure. We never could figure out why he had so much cyanosis. There was a considerable degree, with nothing apparent in the lungs to explain it. It turned out at autopsy that he had a complete thrombotic occlusion of one pulmonary artery with a collateral circulation through the bronchial artery, which was as big as my little finger. It was a chronic closure of one pulmonary artery, and the compensatory circulation had taken care of the nutrition of the lung. The lung was therefore all right, indeed it was in better shape than the lung that was not shut off from the pulmonary artery because the latter had edema while the former did not. Air went in and out, so that it gave normal physical signs. That case taught me that when you have a cyanosis that seems to be a little difficult to explain you should think of some process in the pulmonary circuit, possibly a thrombosis or perhaps an embolic process. I think Dr. Mallory has taught us of late years that multiple infarcts in the lungs are not at all uncommon. We find over and over again that people have showers of small infarcts in the lungs, and something of that kind may have taken place in this case, so that one might have a combination of simple cardiac failure and some such process in the lungs aggravating the condition. I wonder if the episode that occurred just before the second entry, when he became orthopneic and had rapid spread of edema, might not have been due to something of that sort. I can only guess at that because I have none of the actual criteria to make such a diagnosis. I have no story of bloody sputum — nothing that is definite proof — no story or description of engorged neck veins. I suspect, however, that multiple pulmonary infarction is a good possibility.

The best I can do with this case is to say that the man did have congestive heart failure with a large heart. I should expect to find both sides hypertrophied and dilated, and to find edema of the lungs, hydrothorax and ascites. We know he had all these things. I suspect that some thing will be found in the pulmonary artery in the shape of thrombosis with multiple infarcts. I am intrigued with the story about the veins in the legs and wonder if the situation is a composite one of congestive heart failure due to chronic pulmonary disease and on top of that a phlebitis related to the varicosities in the leg that may provide a source for emboli. That is all I can do with the data I have. I suppose I have forgotten some

was not accompanied by cough or other symptoms. By that time the pain had become very severe and had spread to the left side, deep in the upper quadrant.

Physical examination revealed an extremely obese, acutely ill woman lying listlessly in bed. The skin was sallow. There was marked tenderness in the mid-epigastrium, becoming less acute laterally along the costal margins. A smooth, firm, movable, non-tender mass with rounded edges and smooth surfaces was palpable in the left flank and extended almost into the pelvis. The heart and lungs were negative except for the systolic murmur previously noted. The blood pressure was 100 systolic, 70 diastolic.

The temperature was 99.5°F., the pulse 110. The respirations were 30.

The urine examination was negative. The blood showed a red-cell count of 3,570,000 with 70 per cent hemoglobin. The white-cell count was 10,200, 57 per cent polymorphonuclears and no abnormal forms in the smear. The nonprotein nitrogen of the blood was 59 mg per cent, the protein 4.2 gm. The van den Bergh was normal, indirect. A blood Wassermann test was negative.

An x-ray of the chest showed the right diaphragm to be high and flattened. There were several dense areas just above the right diaphragm which appeared to be areas of atelectasis. The upper portion of the right lung and the entire left lung were clear. A flat plate of the abdomen showed the kidney outlines to be distinct. The left kidney was not quite so low as the right, and there were no stones. A large soft-tissue mass was present in the left upper quadrant which extended down to the region of the crest of the ilium and had the general shape of the spleen. The shadow of the liver did not seem to be grossly enlarged. An intravenous pyelogram showed poor excretion by both kidneys. The pelves and calices were not seen, and the bladder was not filled. A Graham test was done and failed to show any gall-bladder shadow. No gallstones were demonstrated. A barium enema was negative.

On the third day her skin seemed to have a somewhat indefinite, bronzed color and the blood pressure was 82 systolic, 64 diastolic. She was apparently failing rapidly. There were questionable signs of fluid at the right lung base. A consultant reviewed the blood smear and was of the opinion that it showed about 4 per cent very immature white cells. On the seventh day she was very dyspneic, and her extremities were cold, clammy and cyanotic. The nonprotein nitrogen was 130 mg and the carbon-dioxide combining power was 28.8 vol per cent. The serum sodium was equivalent to 110.7 cc., and the serum chloride

to 88 cc of N/10 sodium chloride. She died that day.

DIFFERENTIAL DIAGNOSIS

DR RICHARD B KING It seems to me that the decision we have to make here is whether the first admission had anything to do with her death. I am inclined to believe that she had two unrelated conditions and that the first admission was in some way related to the gall bladder, that is what they were thinking about of course. The description of the attack is perfectly consistent with gall-bladder disease. It lasted two and a half days—a very unusual duration for pain associated with diaphragmatic hernia or acute ulcer. The fact that they mention it was not related to exertion or motion indicates that they thought of coronary thrombosis, but did not believe it was that because they did not have electrocardiograms made. The blood pressure was 150 systolic, 100 diastolic, and examination of the heart itself failed to reveal anything noteworthy. The description of that attack is perfectly consistent with gallstones or cholecystitis, and probably not related to the thing that killed her. It is interesting that she stated that the stools had been black, off and on I presume, for a year. It is always questionable how much importance you can put on such a statement without knowing whether she had taken an iron tonic which would have colored the stools. There was no evidence of trouble in the gastrointestinal tract at the time of first entry. She had a normal gastrointestinal series and a negative barium enema. They were looking for gall-bladder disease, and they did a second Graham test because they were skeptical about the first. We all know, however, that one can have gall-bladder disease without its showing in the Graham test. The shaking chill is curious, I should like to know whether she sweat following it and whether the temperature, which had fallen before the chill, went up again. I do not know how to interpret it. I should guess that at the time of the first admission she had gall-bladder disease, with a long attack of gall-bladder pain.

When we come to the second admission we realize that a lot has happened in the interim, and it is this story which concerns us in regard to the patient's death. The pain in the right upper quadrant, which was constant, unremitting and crushing, is hard for me to believe. I do not see how a patient could live for six months with unremitting, crushing pain, night and day. It seems to me that if it was as severe as described she would have been unable to sleep and would have died of exhaustion. It is impossible for me to relate the pain with the gall bladder, and I do not know any condition in the liver which could cause pain

as a duodenal ulcer, a rectal polyp, diverticula of the colon and a hypertrophied prostate

A PHYSICIAN Did he have any disease of the mitral or aortic valve?

DR MALLORY No He had slightly calcified atheromatous plaques on the posterior surface of the mitral valve, a very common spot for them at that age, and they never, so far as I know, have any functional significance The heart weighed 525 gm The right ventricular wall measured 8 mm in thickness, and the columnae carneae on the right were larger than those on the left The pulmonary orifice was normal in circumference but the tricuspid valve measured 16.5 cm, which indicates considerable dilatation The coronaries showed some calcification but no significant narrowing The liver showed a slight degree of cardiac cirrhosis

DR. MEANS The loud systolic murmur was probably functional

DR MALLORY I should think it must have been

CASE 24062

PRESENTATION OF CASE

First Admission A sixty-year-old Jewish housewife entered the hospital with the complaint of abdominal pain of two and a half days' duration

Two and a half days before entry the patient was quite suddenly taken with a severe pain in the epigastrium which seemed to start on both sides and constrict toward the middle, with radiation through to the back, but not to the shoulders, arms or substernal region The pain was not related to exertion, emotion or the intake of food It was accompanied by nausea, perspiration, hot and cold feelings, some faintness and dizziness, but no vomiting or chills She went to bed, but the pain continued unrelieved by aspirin until the time of entry She was unable to sleep, and in spite of various laxatives failed to have a bowel movement

For the previous three years she had had occasional similar attacks of pain which were very mild and of brief duration During that period she had noticed gradually increasing anorexia so that her diet became very limited, although she still remained very obese Her greatest weight had been 200 lb., and at the time of entry she weighed 180 lb She thought she had lost about 10 lb during the week before entry During the year before entry she had become constipated Previously she had never had any trouble with her bowels, but it became necessary for her to take large doses of laxatives to obtain a movement She stated that her stools had been black during this period but

never bloody or clay colored She had never had any jaundice or other gastrointestinal symptoms.

She had had malaria as a child but denied ever having had typhoid or venereal disease. She experienced some dyspnea on climbing stairs, and she said that her ankles had been swollen for years She had no other cardiorespiratory symptoms For two years she had had some nocturia and frequency The family history was noncontributory

Physical examination revealed an extremely obese woman in considerable discomfort from abdominal pain There was a rough systolic murmur heard all over the precordium, and the heart sounds were of good quality The blood pressure was 150 systolic, 100 diastolic The abdomen showed tenderness to deep palpation in both upper quadrants, more marked on the right just below the costal margin There were no masses or spasm One observer thought the liver edge was palpable There were bilateral varicose veins with varicose ulcers on both lower legs

The temperature was 100.5°F., the pulse 90 The respirations were 20

The urine examination was negative The white-cell count of the blood was 7900 The hemoglobin was 85 per cent The nonprotein nitrogen of the blood was 27 mg per cent, and the van den Bergh was slightly above normal, with an indirect reaction A blood Hinton test was negative.

A Graham test showed normal filling and emptying of the gall bladder, and a gastrointestinal series was negative

She vomited once shortly after entry, and on the second hospital day had a shaking chill, although her temperature had fallen to normal On the ninth day a barium enema showed no evidence of a pathologic lesion, and on the following day the Graham test was again negative The pain subsided during her stay in the hospital, and she was discharged on the eleventh day

Final Admission (eight months later) The patient was fairly well for about two months following discharge, but then began to have severe, constricting pain deep in the right upper quadrant, which did not radiate The pain was constant, unremitting and crushing in nature, not sharp or colicky She had had no known fever or jaundice, and believed that there had been no change in the color of her stools or urine. On one occasion, a short time before re-entry, she had a shaking chill. She developed severe anorexia and, when she did eat, felt nauseated but never actually vomited About a month before re-entry she went to bed because of weakness and continued pain and remained there until she was brought to the hospital Two weeks previously she developed dyspnea which was not relieved by sitting up and

grade of vascular nephritis, not enough, however, in itself to explain uremia. I should be inclined to attribute the renal failure to a combination of factors in a moribund patient. She was hypertensive when she first came in so that she had kidneys accustomed to a blood pressure of 160 systolic, 100 diastolic, and when they were forced to work with a blood pressure of 80 systolic, 60 diastolic, they failed.

A PHYSICIAN: How about the epigastric pain?

DR. MALLORY: I have no explanation for that unless it was due to the spleen, which seems a little unlikely, or to the enormously enlarged retroperitoneal nodes around the celiac axis.

A PHYSICIAN: You did not examine the spine?

DR. MALLORY: We took sections from several vertebrae. We did not examine the cord. It is possible that she had a nerve-root involvement.

of that sort and which would last six months. It might be a nerve pain in the sense that one can have shingles with pain lasting for years, and I should be inclined to interpret it as having something to do with pressure on, or infiltration of, nerves. She was then getting short of breath and in the habit of sitting up. She was probably developing anemia. None of these things suggest trouble in the cardiovascular system. The original swelling of the feet and the shortness of breath which she had had for years could be explained on the basis of the varicose veins and obesity.

The whole crux of this matter seems to rest on whether the mass felt on the physical examination was the spleen. All the evidence points to its being spleen. They did everything to rule out the kidney. It was not a tumor related to the kidney, and a tumor arising from the pelvis would not give that kind of shadow. They made no note of a notch, this is disturbing because in spleens of that size we almost always feel a notch and describe it. I am convinced, however, that the mass was the spleen. Assuming this to be so, we have to explain the anemia, the finding of queer cells in the blood smear, the pain, the patient's death. It seems to me that a lot happened more or less simultaneously in relatively widely separated areas,—the rise in nonprotein nitrogen, the fall in blood pressure, the low serum sodium,—which suggests that we are dealing either with metastases to various places or a widespread vascular disorder, or with what seems more likely to me leukemic infiltration of various organs. As to the cause of death, it could have been renal or adrenal failure, or a combination of the two. The findings in the chest could be leukemic infiltration or irritation of the pleura or lungs, or both. I believe that the patient had gall-bladder disease, not related to death, and aleukemic leukemia type undetermined. There is no description of these peculiar cells which were seen in the blood smear, and the fact that they were not named makes me feel that the observer was unable to classify them.

CLINICAL DISCUSSION

DR J. W. ZELLER. When I saw this patient a few days before death, I thought the mass in the left upper quadrant was the spleen although it was disturbing that it had not been noticed there eight months previously. The lymph nodes were certainly not striking. The inguinal and axillary nodes were not palpable, although at autopsy they looked as if they should have been, in spite of her obesity. The blood smear showed a few young cells, I did not know exactly into what series they fell but thought they were lymphocytes. I thought

she had lymphoblastoma. The systolic murmur was very harsh and certainly indicated some organic disease of the mitral valve.

CLINICAL DIAGNOSES

Coronary thrombosis?
Chronic cholecystitis?
Lymphoblastoma?
Arteriosclerotic heart disease.

DR KING'S DIAGNOSES

Chronic cholecystitis
Aleukemic leukemia, ? type
Leukemic infiltration of kidneys, adrenal glands, spleen, lungs and retroperitoneal lymph nodes

ANATOMICAL DIAGNOSES

Aleukemic lymphatic leukemia
Thrombosis of iliac and pelvic veins and inferior vena cava
Edema of the legs
Hydrothorax, right.
Arteriosclerosis slight, coronary, moderate, aortic, moderate, mitral and aortic valves
Nephritis, chronic vascular
Obesity

PATHOLOGICAL DISCUSSION

DR TRACY B. MALLORY. The autopsy showed a very large spleen that weighed over 1200 gm and a diffuse enlargement of lymph nodes all over the body, particularly the retroperitoneal nodes. The liver was normal in size, but the markings were a little exaggerated—the branchings of the portal tree could be seen with a distinctness that you do not see in a normal liver but do at times in leukemic infiltration. The gall bladder and bile ducts were absolutely negative. The heart showed partially calcified, atheromatous plaques on the mitral valve, the valve margins were normal, and I do not believe its function was interfered with. The one other important finding in gross was a very extensive thrombophlebitis of both iliac veins and of the deep pelvic veins, which had extended up the vena cava as far as the mouth of the renal vein. It was not a completely occluding thrombus, however, filling only about half the lumen. Microscopic examination showed a typical leukemic infiltration of the spleen, lymph nodes, liver and bone marrow. It was of undifferentiated type, but probably lymphoid.

A PHYSICIAN. What about the adrenals?

DR MALLORY. They showed microscopically a little lymphoid infiltration but nothing in gross and nothing that I think could have interfered with function. The kidneys showed a moderate

STATE POSTGRADUATE COURSES

THE plan of the Committee on Postgraduate Education for the present year deserves commendation. Not only is a wide variety of subjects presented to the districts, but there is special emphasis on syphilis and gonorrhea, in collaboration with the program of the United States Public Health Service. "Early Syphilis" and "Gonorrhea in the Male" have been selected for presentation for the present year, with the intent of continuing in future years and eventually covering these subjects thoroughly. It is worthy of note that the course in syphilis has been dedicated to the late Dr. C. Morton Smith, whose interest and advice in the course before his death aided greatly in its preparation.

These courses are illustrated with many lantern slides, including charts and colored slides which show various phases of these diseases. They cover quite thoroughly the practical matters of diagnosis and treatment, and deserve a large attendance by practicing physicians in the various districts. Massachusetts physicians are now given an opportunity to become up-to-date on subjects about which more patients can be expected to ask questions in view of the publicity now being given to these diseases.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS
AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 58 BLEEDING AT TERM—
PARTIAL SEPARATION OF THE PLACENTA

Mrs. G. R., a twenty-three-year-old primipara, was admitted to the hospital on October 1, 1937. She was at term, the membranes had ruptured one hour before admission, and she had experienced two or three attacks of mild abdominal pains, and had a slight bloody show.

The family history was negative. The patient's health had always been good. She had had

measles as a child. The onset of menstruation occurred at thirteen. A regular thirty-day cycle was established, and the periods lasted three or four days without pain. The last menstrual period began on December 29, 1936.

The antenatal course was entirely normal. Her blood pressure remained at a level averaging 105 systolic, 70 diastolic. Repeated urinalyses were normal, the blood Wassermann was negative.

She was seen at 5 a. m. on the day of admission. Examination revealed a robust young woman in no apparent distress, with temperature 98.6°F, pulse 80 and respirations 22. The mucous membranes were of normal color. The thyroid gland was slightly enlarged. The lungs were normal to percussion and auscultation. The heart was normal in size, the sounds were regular and clear, no murmurs were heard. Abdominal examination revealed a pregnancy at term. The baby was large and presented as a right occiput anterior. The head was unengaged and could be moved above the pelvic inlet. The fetal heart sounds were normal. Rectal examination revealed a long, thick cervix, which admitted the tip of the examining finger. During the examination a moderate amount of blood-tinged amniotic fluid exuded. Examination of the blood showed a red-cell count of 3,950,000, a white-cell count of 7800 and a hemoglobin of 80 per cent (Sahli), the smear was normal.

Three hours after admission the labor pains were still mild and irregular. The blood loss was definitely in excess of the normal show. The head remained unengaged, and the fetal heart sounds normal. The patient was seen in consultation, and a diagnosis of partial premature separation of the placenta was made. A vaginal examination ruled out a placenta previa. As recommended by the consultant, the cervix and vagina were packed with iodoform gauze, an indwelling catheter was placed in the bladder, and a Spanish windlass was applied. The patient's condition at 11 a. m. was satisfactory, her pulse was strong, and the rate was 96. The blood pressure was 100 systolic, 60 diastolic.

In order to control the restlessness 1/6 gr. morphine sulfate and 9 gr. sodium amylal were given during the early afternoon. At 4 p. m. the patient was not definitely in labor, and 0.07 cc. (1 minim) obstetrical Pituitrin was ordered every half hour for three doses, active labor promptly followed. At 7 p. m. the patient began to complain of pressure on the rectum. The packing was removed, and no bleeding followed. Rectal examination revealed a moderately thick but soft cervix, which was three fingers dilated. The presentation was right occiput transverse, and the vertex was at the level of the ischial spines. During the evening

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

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PROPOSED ADMINISTRATIVE ECONOMIES IN BOSTON

MAYOR TOBIN is to be congratulated on his stand in relation to economy in city administration. As it affects the medical and surgical care of the sick, his first step is, in our opinion, an excellent and long overdue one. The closing of the two relief stations that have for years encumbered the Boston City Hospital is, from the point of view of the individual patient's welfare, a most important and beneficial action. The equipment and personnel at both relief stations has never compared in adequacy with that available at the main hospital and, in the very nature of things, never could. On the other hand, and equally in the very nature of things, this personnel with its inadequate equipment was asked every day and night to face the most difficult and serious types of medical and surgical emergencies — emergencies that, when they

did reach the main hospital, taxed to the utmost that staff with its specialists and modern equipment.

It has been argued that these stations should be kept open. Why? Because, say the proponents, the greater delay necessary to move patients to the main hospital will endanger their lives and welfare. There *was* a significant delay in the horse-drawn ambulance days, but with the modern police or hospital motor ambulance it no longer exists. Is there any other reason why the seriously injured citizens of Boston still must be forced to undergo the most important part of their treatment after a major injury, at the hands of an inadequate staff which is further handicapped by a short age of equipment? Yes. Because these relief stations have served — particularly the East Boston one — as outpatient departments. If they are closed the local residents who need outpatient care will have to go to local physicians or to the Outpatient Department of the main hospital. This is a bother but is no more than that, and does not justify the expenditure of large sums by the city to save patients carfare, nor does it justify subjecting these same patients to an appreciably greater liability to death if and when they are struck by an automobile or fall into the hold of a ship.

This initial move, while most praiseworthy, must not be allowed to justify less meritorious economies. It has been reported in the daily press that the Boston City Hospital budget must be cut \$400,000 in addition. It is hard to see how this can be done without curtailing or even eliminating services that the public has every right to expect and demand. Because these services have not the same news value as that of relief stations does not mean that they are less essential.

The trustees and the Mayor should recognize the futility and danger of forcing the organization at the Boston City Hospital to regress to the conditions of fifteen or twenty years ago. The trustees should not be permitted to do this, nor should the Mayor be allowed, through lack of understanding, to place himself in the position of demanding such a sacrifice even if no money is saved from the hospital budget.

CHILD BEHAVIOR

Since the behavior of children has been a matter of interest to adults from time immemorial, any attempt to deal with what we think we know about the subject must of necessity be very sketchy. Only a few of the high lights, especially those which have been cast by the careful observations of the past few years, can be mentioned.

Children's behavior depends so much upon their physical and mental development that we must consider in our discussion both these factors. Gessell at Yale has pointed out that there are types of activity which usually make up a part of the lives of all normal infants and children at about the same age. Thus the ability to roll over is the foundation stone upon which sitting up is later built, and the ability to understand pictures, peculiar to man and perhaps to the chimpanzee, is the first step toward the understanding and recognition of symbols which make reading possible. There is a growing suspicion that these newly appearing activities are the result of development of parts of the nervous system which are not mature at birth. Thus the normal new born baby does not have to be taught to breathe or suck, if left to itself the need of air will cause it to breathe, and hunger when it comes will cause the baby to suck and swallow when suitable food is properly presented. We call such activities instinctive, but that merely means that the nervous machinery necessary for their carrying out is already present and ready to go at the time of birth. Indeed, as in most of nature's provisions, such leeway is provided that these fundamental activities take place effectively even though birth occurs as much as two months or more before term.

Certain activities which develop after birth are almost as automatic in the normal child as breathing and sucking. Among these may be mentioned sitting, standing and walking. Ordinarily they are not learned in the sense that reading is learned, the growing infant acquires them when he is ready, without teaching or encouragement. Those of us who feel that we must control the world for our children are tempted to try to vary the automatic schedule either by teaching the baby walking before he is ready (to keep him up with the Jones's baby) or by keeping him from walking when he is ready (to prevent his developing bowlegs). Walking develops at about its own pace in either case, and attempts to interfere with it often disturb the baby's disposition.

Many of the other acquired activities of infancy and childhood are largely automatic and the result of ripening processes in the nervous system. If not interfered with by ambitious or solicitous parents, they appear in an orderly fashion, but if attempts are made to force them, resistances and emotion are often built up which delay or modify their appearance. It is impossible to describe all these activities but as examples may be mentioned such things as being weaned from the bottle to the cup, chewing and swallowing solid foods, and the like. Of course, if the baby is never given the cup or solid foods he will not learn to deal with them, but if too much interest and effort are centered on teaching their use too early, resistance to them is often established. Such an attitude of resistance may delay the accomplishment of the desired activity for a long time, and may influence the personality of the child toward his family or the world in later life.

The control of bowel movements and urine is a matter over which many parents fuss too much. All dog trainers know that it is useless to try to housebreak a puppy

before it has attained an age of several months, but parents are often unwilling to wait a reasonable time before attempting so to train their children. Everyone knows that people accustomed to handling babies can prevent their soiling themselves in the day by having them use a chamber from the time they are a few months old, but this is not so much training the baby as it is getting the nurse to learn when a movement may be expected and acting accordingly. It is also possible to keep a toddler dry in the day by having an adult handy to put him on the toilet every fifteen minutes or half hour or however often he needs to go, an interval usually ascertainable by observation. This is not education so far as the baby is concerned and may well rouse antagonism on the baby's part to an extent making it wise to abandon attempts to teach toilet habits at this age. Even after the child has learned to ask to go, it is important to realize that the interval between his warning sensation and the need for relief is so short that it may be impossible for him, in spite of the best intentions, to reach the toilet in time.

Bed wetting is a type of infantile behavior often carried over into childhood, often because of too early enthusiastic efforts to stop it. Dry nights may become habitual as a result of picking up two-year-old children at adult bed time and taking them to the toilet. Many children do not, however, respond to this treatment, and it is most important that their wet beds shall not be considered a matter of interest until they are three years old or more. Realization of these facts would, of course, not prevent all the wet beds in Christendom, but would certainly reduce their number.

The older children become, the more important teaching is in their learning new activities. In spite of this, the fact that growing up is still going on in the brain must never be forgotten. Reading is such an activity. No one would expect most three- or four-year-old children to learn to read, some children are ready to learn at four or five, most by six and an appreciable number, who are otherwise quite normal, not until they are eight or nine. An occasional child will pick up reading from magazines about the house or from his brothers and sisters at home, but for most children reading is an acquired art learned only through the medium of suitable material properly presented. The point I wish to make is that until the child is ready to learn to read, it makes no difference how skillfully the subject is presented to the child he cannot make use of it. Psychologists and schoolteachers have recently been working out tests to show whether a child is ready for reading. If these tests could be applied to all children before any attempt to teach reading is made, and if parents could be persuaded to accept the results placidly, it would cut out many, many hours of heartache and the resultant behavior difficulties.

It is therefore of the utmost importance for parents to realize that their place in the care of their infants and children is in supplying to them food, clothing, shelter and affection. The fact that it is so much more convenient to have food prepared at stated times and that the busy mother or nurse can bathe and dress the child at only certain times, will automatically teach him a little about getting on with the world. Little children will learn most of what they need to learn either automatically or by imitation. If at appropriate ages they have not, then careful investigation of why they do not is in order.

* * *

Q I have a family of several children about whom I should like to ask you. In the first place my baby of twelve months is not yet walking. When I see my neighbor's baby two months younger, walking I wonder

A. Green Lights to Health broadcast given by Dr. Randolph K. Byers on Wednesday January 26 and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

she was given 6 gr sodium amytal. Throughout this time there was no vaginal bleeding, and the fetal heart sounds remained normal. At midnight the head was on the perineum. The voluntary effort in the second stage was poor, this was probably due to the medication. Solid blade forceps were applied to the head on the perineum, a median episiotomy was made, and a 9-lb baby boy easily delivered. The infant cried spontaneously. The blood loss during the delivery did not exceed 300 cc, and the total blood loss was approximately 450 cc. The placenta was rectangular in shape. There was an adherent dark-red blood clot covering one angle.

The puerperium was afebrile, and the patient was discharged home on the twelfth postpartum day. The episiotomy was well healed, and the uterus had involuted normally. The baby had regained its birth weight.

Comment. Conservative treatment is of value in cases of premature separation of the placenta if the baby is dead, or very premature, if the mother is very toxic and the chances for a living baby are poor, if the mother is a poor operative risk or if labor has started and examination reveals a soft cervix with some dilatation, and if it is felt that the so-called Couvelaire uterus is not present. The conservative treatment consists of methods to control the bleeding, to improve the patient's general condition and to deliver the baby. The patient should be treated for shock, if it is present. The cervix and vagina should be packed tightly with iodoform gauze or sterile gauze, or a Voorhees's bag should be inserted, and a firm binder with a Spanish windlass should be applied to the abdomen. This usually controls the bleeding. Blood transfusion may then be resorted to, if indicated, or intravenous glucose may be given. Small doses of analgesic drugs should be administered, and when the cervix is fully dilated, the baby should be delivered. This case illustrates the use of conservative treatment.

However, if we have a living baby at term, in a primipara who has a long rigid, undilated cervix, delivery is best accomplished by an abdominal cesarian section. This also applies to patients in whom uteroplacental apoplexy (Couvelaire uterus) is suspected. In some cases of uterine apoplexy it may be necessary to resort to the Porro operation to control the bleeding.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public

Health Service and the Federal Children's Bureau, have been arranged for the week beginning February 14

BRISTOL NORTH

Thursday, February 17, at 4 00 p m., at the Morton Hospital, Taunton. Subject: The Use and Misuse of Prontylin. Instructor: Benjamin W Carey, Jr. Arthur R. Crandell, *Chairman*.

BRISTOL SOUTH (New Bedford Section)

Friday, February 18, at 4 00 p m., at St. Luke's Hospital, New Bedford. Subject: The Use and Misuse of Prontylin. Instructor: Benjamin W Carey, Jr. Robert H Goodwin and Howard P Sawyer, *Chairmen*.

ESSEX SOUTH

Tuesday, February 15, at 4 00 p m., in the Nurses Home, Salem Hospital, Salem. Subject: Pneumococcus Pneumonia and Serum Therapy. Instructor: Maxwell Finland. Walter G Shippen, *Chairman*.

MIDDLESEX EAST

Tuesday, February 15, at 4 00 p m., at the Melrose Hospital, Melrose. Subject: Cesarean Section, Analgesia. Instructor: M. Fletcher Eades. Joseph H. Fay, *Chairman*.

MIDDLESEX NORTH

Friday, February 18, at 7 00 p m., at St. John's Hospital, Lowell. Subject: Early Syphilis. Instructor: C Guy Lane. William S Lawler, *Chairman*.

NORFOLK

Friday, February 18, at 8 30 p m., at the Norwood Hospital, Norwood. Subject: Atelectasis in the Newborn. Instructor: Clement A. Smith. Hugo B C Ruemer, *Chairman*.

NORFOLK SOUTH

Monday, February 14, at 8 30 p m., at the Quincy City Hospital, Quincy. Subject: Differential Diagnosis and Treatment of Scarlet Fever. Instructor: Edwin H Place. David L. Belding, *Chairman*.

PLYMOUTH

Tuesday, February 15, at 4 00 p m., in the Rosa Field Nurses' Residence, Brockton Hospital (rear of hospital), Brockton. Subject: Rheumatic Infection, Rheumatic Heart Disease. Instructor: Edward F Bland. Walter H. Pulsifer, *Chairman*.

WORCESTER (Milford Section)

Thursday, February 17, at 8 30 p m., in the Nurses Home of the Milford Hospital, Milford. Subject: Toxemias of Pregnancy. Instructor: John Rock. Joseph Ashkins, *Chairman*.

WORCESTER NORTH

Friday, February 18, at 4 30 p m., at the Burbank Hospital, Fitchburg. Subject: Differential Diagnosis and Treatment of Scarlet Fever. Instructor: Conrad Wesselhoeft. Edward A Adams, *Chairman*.

CHILD BEHAVIOR

Since the behavior of children has been a matter of interest to adults from time immemorial, any attempt to deal with what we think we know about the subject must of necessity be very sketchy. Only a few of the high lights, especially those which have been cast by the careful observations of the past few years, can be mentioned.

Children's behavior depends so much upon their physical and mental development that we must consider in our discussion both these factors. Gessell at Yale has pointed out that there are types of activity which usually make up a part of the lives of all normal infants and children at about the same age. Thus the ability to roll over is the foundation stone upon which sitting up is later built, and the ability to understand pictures, peculiar to man and perhaps to the chimpanzee, is the first step toward the understanding and recognition of symbols which make reading possible. There is a growing suspicion that these newly appearing activities are the result of development of parts of the nervous system which are not mature at birth. Thus the normal new-born baby does not have to be taught to breathe or suck, if left to itself the need of air will cause it to breathe, and hunger when it comes will cause the baby to suck and swallow when suitable food is properly presented. We call such activities *inscune*, but that merely means that the nervous machinery necessary for their carrying out is already present and "ready to go at the time of birth. Indeed, as in most of nature's provisions, such leeway is provided that these fundamental activities take place effectively even though birth occurs as much as two months or more before term.

Certain activities which develop after birth are almost as automatic in the normal child as breathing and sucking. Among these may be mentioned sitting, standing and walking. Ordinarily they are not learned in the sense that reading is learned, the growing infant acquires them when he is ready without teaching or encouragement. Those of us who feel that we must control the world for our children are tempted to try to vary the automatic schedule either by teaching the baby walking before he is ready (to keep him up with the Jones' baby) or by keeping him from walking when he is ready (to prevent his developing bowlegs). Walking develops at about its own pace in either case, and attempts to interfere with it often disturb the baby's disposition.

Many of the other acquired activities of infancy and childhood are largely automatic and the result of ripening processes in the nervous system. If not interfered with by ambitious or solicitous parents, they appear in an orderly fashion, but if attempts are made to force them, resistances and emotion are often built up which delay or modify their appearance. It is impossible to describe all these activities but as examples may be mentioned such things as being weaned from the bottle to the cup, chewing and swallowing solid foods, and the like. Of course, if the baby is never given the cup or solid foods, he will not learn to deal with them, but if too much interest and effort are centered on teaching their use too early, resistance to them is often established. Such an attitude of resistance may delay the accomplishment of the desired activity for a long time, and may influence the personality of the child toward his family or the world in later life.

The control of bowel movements and urine is a matter over which many parents fuss too much. All dog trainers know that it is useless to try to housebreak a puppy

before it has attained an age of several months, but parents are often unwilling to wait a reasonable time before attempting so to train their children. Everyone knows that people accustomed to handling babies can prevent their soiling themselves in the day by having them use a chamber from the time they are a few months old, but this is not so much training the baby as it is getting the nurse to learn when a movement may be expected and acting accordingly. It is also possible to keep a toddler dry in the day by having an adult handy to put him on the toilet every fifteen minutes or half hour or however often he needs to go, an interval usually ascertainable by observation. This is not education so far as the baby is concerned and may well rouse antagonism on the baby's part to an extent making it wise to abandon attempts to teach toilet habits at this age. Even after the child has learned to ask to go, it is important to realize that the interval between his warning sensation and the need for relief is so short that it may be impossible for him, in spite of the best intentions, to reach the toilet in time.

Bed wetting is a type of infantile behavior often carried over into childhood, often because of too early enthusiastic efforts to stop it. Dry nights may become habitual as a result of picking up two-year-old children at adult bed time and taking them to the toilet. Many children do not, however, respond to this treatment, and it is most important that their wet beds shall not be considered a matter of interest until they are three years old or more. Realization of these facts would, of course, not prevent all the wet beds in Christendom, but would certainly reduce their number.

The older children become, the more important teaching is in their learning new activities. In spite of this, the fact that 'growing up' is still going on in the brain must never be forgotten. Reading is such an activity. No one would expect most three or four-year-old children to learn to read, some children are ready to learn at four or five, most by six and an appreciable number, who are otherwise quite normal, not until they are eight or nine. An occasional child will pick up reading from magazines about the house or from his brothers and sisters at home, but for most children reading is an acquired art learned only through the medium of suitable material properly presented. The point I wish to make is that until the child is ready to learn to read, it makes no difference how skillfully the subject is presented to the child, he cannot make use of it. Psychologists and schoolteachers have recently been working out tests to show whether a child is ready for reading. If these tests could be applied to all children before any attempt to teach reading is made, and if parents could be persuaded to accept the results placidly, it would cut out many, many hours of heartache and the resultant behavior difficulties.

It is therefore of the utmost importance for parents to realize that their place in the care of their infants and children is in supplying to them food, clothing, shelter and affection. The fact that it is so much more convenient to have food prepared at stated times and that the busy mother or nurse can bathe and dress the child at only certain times, will automatically teach him a little about getting on with the world. Little children will learn most of what they need to learn either automatically or by imitation. If at appropriate ages they have not, then careful investigation of why they do not is in order.

* * *

Q I have a family of several children about whom I should like to ask you. In the first place my baby of twelve months is not yet walking. When I see my neighbor's baby, two months younger, walking, I wonder

A. Green Lights to Health broadcast given by Dr. Randolph K. Byers on Wednesday January 26 and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

whether my baby has spinal trouble or whether his brain is all right. What should I do about it?

A. There is a great difference in the age at which normal babies learn to walk. If the baby seems otherwise active and normally interested in his surroundings, have patience. If you think he is not so active as he should be, take him to your doctor for advice, but do not try to urge him to walk, without advice.

Q. Washing and sterilizing bottles is so much trouble that I have taught this baby to drink from a cup. Lately I notice he is sucking his thumb a lot. What should I do about it?

A. Sucking is to a large extent an important emotional satisfaction to infants, the need for which is outgrown at variable ages. Your baby probably still needs it. If you let him get his satisfaction in the way he was meant to in getting his food, he may be less tempted to get it by sucking his thumb. In any case, thumb-sucking at this age is so common that strenuous attempts to break the habit are unnecessary.

Q. My boy of four is so lazy he will not learn to dress himself. How can I teach him?

A. Many children of four are not yet sufficiently skillful with their fingers to fasten buttons. Get him the sort of underwear held on by soft elastic strips around the shoulders and let him put that on while you fasten the buttons of his outer clothing.

Q. My two-year-old is terrible, whatever I ask of him he says, "No."

A. One of the striking characteristics of many two-year-olds is so-called negativism. Try to warn him that you are going to make a request a few minutes before you make it, and then make it in a quietly confident manner. Be very sure to make just as few requests as possible.

Q. I have tried to train this child to move his bowels every day at the same time, but sometimes he moves them twice one day and not at all the next. How can I train him?

A. Regularity of bowel movement at his age is not essential, though very desirable. If his stools do not become hard, let him move his bowels when he feels the need. Very often the price paid in emotional upset by the baby and parent in securing absolute regularity of bowel movement is not worth the result.

* * *

In summary I want to stress the fact that the development of new activities in babies and young children comes not as the result of teaching but as the result of development and growth in the brain and nerves attached to it. Attempts to interfere with the unfolding of the normal schedule of activity, if carried on strenuously, tend to rouse resistances and dislikes in babies, which very often affect their personalities in childhood and adult life. The temptation to send children to school before their brains have matured to the point which allows them to understand schoolwork is very apt to have the same sort of effect. Mistakes along these lines on the part of parents are very apt to cause unsatisfactory behavior in their children, and tolerance on the part of parents for slow development in the babies is often rewarded by children with stable dispositions.

MISCELLANY

DR. VAUGHAN TO ADDRESS MEETING OF BOSTON TUBERCULOSIS ASSOCIATION

Dr. Henry F. Vaughan, who has been the health commissioner of Detroit, Michigan, since 1919, will be the speaker at the annual meeting of the Boston Tuberculosis Association which will be held at the Hotel Copley Plaza on February 15, at 4 p. m. Dr. Vaughan has been with the Detroit Health Department since 1914, first serving as sanitary engineer and later as assistant health commissioner. During the World War he dropped out of the department to serve as captain in the Sanitary Corps, United States Army. At Camp Upton he was the camp epidemiologist, then, together with Major Russell L. Cecil, he was commissioned by Surgeon General Gorgas to make a special study of the epidemiology and prevention of pneumonia at Camp Wheeler. Dr. Vaughan is a trustee of the W. K. Kellogg Foundation with headquarters in Battle Creek, Michigan. This foundation, chartered to improve the health, welfare and happiness of children, is conducting a community health service program in seven rural counties of southwestern Michigan. An effort is being made to co-ordinate all the resources of these communities for the improvement of child health. The foundation is spending approximately \$1,000,000 annually in this program. Dr. Vaughan has been particularly interested in recent years in advancing the so-called plan of medical participation—the purpose of which is to extend the influence of the community health service by integrating therein the facilities and services of the physician and dentist in private practice. This type of program is proposed as an adjunct to the fundamental services of a whole time local health department. Dr. Vaughan has served on innumerable committees, both administrative and research, of the American Public Health Association, of which organization he was president in 1925. He has also served on the boards of many other national health organizations. He has been a teacher of public health administration since 1915 and is now professor of public health administration at Wayne University, Detroit, and a special lecturer at Vanderbilt University and the University of Michigan.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR DECEMBER, 1932

DISEASES	DECEMBER 1932	DECEMBER 1931	FIVE YEAR AVERAGE
Anterior poliomyelitis	1	0	6
Chickenpox	1671	1393	1484
Diphtheria	18	18	78
Dog bite	574	497	413
Dog bites	72	63	108
German measles	495	590	579
Gonorrhea	411	557	504
Lobar pneumonia	349	2006	1182
Measles	4	12	8
Meningococcus meningitis	298	663	608
Mumps	0	0	0
Paratyphoid A	3	1	0
Paratyphoid B	928	753	956
Scarlet fever	475	444	401
Syphilis	341	203	261
Tuberculosis, pulmonary	43	25	25
Tuberculosis other forms	19	5	10
Typhoid fever	8	3	2
Undulant fever	732	1738	899
Whooping cough			

*Based on figures for preceding five years

RARE DISEASES

Anterior poliomyelitis was reported from Chicopee, 1, *Diphtheria* was reported from Athol, 1, Boston, 1, Brockton, 2, Cambridge, 1, Chelmsford, 2, Chelsea, 1, Fall River, 3, Framingham, 1, Lawrence, 1, Lynn, 1,

Peabody, 1, Southbridge, 2, Tewksbury, 1, total, 18

Dysentery, amebic, was reported from Newton, 1

Dysentery, bacillary, was reported from Boston, 1, Cambridge, 9, Fall River, 4, New Bedford, 3, Revere, 1, Wellesley, 1, total, 19

Encephalitis lethargica was reported from Northampton, 1

Leprosy was reported from New Bedford, 1

Meningococcus meningitis was reported from Melrose, 1, Pittsfield, 1, Rockland, 1, Tyngsboro, 1, total, 4

Paratyphoid B was reported from Boston, 1, Greenfield, 1, Monterey, 1, Revere, 1, total, 4

Pfeiffer bacillus meningitis was reported from Westfield, 1

Septic sore throat was reported from Beverly, 1, Boston, 2, Cambridge, 2, Gardner, 4, Lawrence, 1, Rutland, 1, Somerville, 1, Wellesley, 1, total, 13

Tetanus was reported from Amherst, 1

Trachoma was reported from Everett, 1, Plymouth, 1, total, 2

Trichinosis was reported from Springfield, 1

Typhoid fever was reported from Belmont, 1, Cambridge, 1, Lowell, 1, Medford, 1, Sharon, 1, Somerville, 1, Stoughton, 13, total, 19

Undulant fever was reported from Boxboro, 1, Brookline, 1, Fitchburg, 1, North Adams, 1, Sterling, 1, Taunton, 2, Westfield, 1, total 8

Diphtheria continued to show low incidence.

Measles, mumps, German measles, and scarlet fever were reported below the five year average.

Paratyphoid fever continued to show record high incidence.

The reported incidences of anterior poliomyelitis, meningococcus meningitis, lobar pneumonia and whooping cough were below the five year average.

Undulant fever showed record high incidence.

Pulmonary tuberculosis, chickenpox and tuberculosis (other forms) were reported above the five year average.

The increase in the reported incidence of typhoid fever was associated with a recent outbreak in Stoughton, epidemiological investigation implicated a banquet, the food of which had been prepared by a carrier

Animal rabies showed record low incidence. New foci were reported in Fitchburg and Westborough

CAMBRIDGE MUNICIPAL TUBERCULOSIS HOSPITAL

Plans have been announced whereby the present Cambridge Home for the Aged and Infirm will be converted into a tuberculosis hospital. In order to meet the minimum standards of the Massachusetts Department of Public Health it was estimated that an outlay of nearly \$400,000 would have been required to build and equip an additional wing to the present sanatorium. The plan has been approved by the Commissioner of Public Health, and the former inmates of the home will be cared for in other institutions, nursing homes and private homes.

CONGRESS ON MEDICAL EDUCATION AND LICENSURE

The thirty fourth annual Congress on Medical Education and Licensure will be held at the Palmer House, Chicago, on February 14 and 15. The first day will be devoted to papers and discussions on medical education. Dr Ray L. Wilbur, of Stanford University, will preside at the morning session, and Dr Frederic A. Washburn,

of Boston, in the afternoon. Of the two morning sessions on the second day, one covering postgraduate education will be in charge of Dr Charles G. Heyd, of New York City, while Dr Jesse W. Bowers, of Fort Wayne, Indiana, will preside at a joint meeting of the Council on Medical Education and Hospitals and the Federation of State Medical Boards. The afternoon session of the Federation of State Medical Boards will be a symposium on promulgation of regulations authorized by law, and will be in charge of Dr Bowers.

REVISION OF PHARMACOPOEIA TESTS

The following revision of the U.S.P. XI tests is hereby announced through the authority of the Committee of Revision and the action of the Board of Trustees.

Aqua Auranti Florum Page 64

Change the test for residue on evaporation to 'Evaporate 100 cc. of the Orange Flower Water on a water bath, and dry the residue to constant weight at 100°C. not more than 0.005 gm. of residue remains'

Benzoinum Page 86.

Omit the test for 'rosin, lines 13 and 14 from the bottom of the page.

Oleum Amygdalae Expressum Page 248

Omit the test for the solidification point of the fatty acids, lines 9 and 10 from the bottom of the page.

The urgency of the revision of these three tests, due to their involving the importation of these official items, necessitates an interim revision announcement. It is expected that from time to time other revisions in official texts will be similarly announced, to meet conditions which demand prompt action.

When enough of these interim revision announcements have accumulated and other added or revised monographs have been adopted it is expected that all these new and revised texts, approved since the appearance of the *First U.S.P. XI Supplement* will be reprinted in full and issued as the *Second U.S.P. XI Supplement*. Interim revisions are being announced through the medical and pharmaceutical press.

E. FULLERTON COOK, *Chairman*
Committee of Revision
of the U. S. Pharmacopoeia

MEDICAL ART ASSOCIATION

The American Physicians' Art Association, a national organization of medical men who have ability in the fine arts, will hold a first national exhibition in the San Francisco Museum of Art, San Francisco, California, in June 1938. (The American Medical Association Convention is June 13-17 in the same city.) The American Physicians Art Association already has an outstanding membership. There are three classifications for membership: active, associate and contributing. The first annual exhibition promises to be of unusual interest with entries to be accepted (after jury selection) in the following classifications: oils, watercolors, sculpture, photography, pastels, etchings, crayon and pen and ink drawings (including cartoons), wood carvings and book bindings. Scientific medical art work will not be accepted. The exhibition is not limited to first showings. All entries close April 1, 1938. Any physician interested should communicate at once with the Secretary of the American Physicians Art Association, Suite 521 536 Flood Building, San Francisco, California.

CORRESPONDENCE

MEDICAL RECORDS

To the Editor The question as to what provision a physician or surgeon should make in regard to his medical records is one which I should like to have help in solving. I am writing this letter in hope that some of the readers of the *Journal* will have sufficiently concrete ideas so that a policy may be formed.

The whole subject was recently brought forcibly to my attention when I saw a doctor's heirs offering for sale his files with the records in them. This was in a small town where several prospective purchasers would have been glad to obtain news about the neighbors. Fortunately, this catastrophe was averted, but it made me think how I should protect my own records.

With the growth of scientific medicine and the careful investigations that many doctors give their patients, combined with the detailed histories, x-ray findings, laboratory reports and records of operations, I believe that a certain proportion of our records would be of real value to the doctor who treats these patients from where we leave off. Would it be feasible for a doctor to leave his records to a small group of physicians with a sufficient sum of money to pay for their storage with the understanding that that group would look through a record before giving it out to the physician to whom it might be of help so that personal letters and irrelevant statements could be first deleted? I have personally had patients referred to me, whose previous surgeon had died, where the pathological findings and procedures of a previous operation would have been very helpful. I believe that in straight medical cases the past histories and laboratory findings would be equally useful to a physician who was carrying on.

At present, I can see no course open to us as physicians but the simple one of burdening our nonmedical families with the responsibility of our records and the request that they be destroyed at the end of a certain period of time.

HILBERT F DAY, M.D.

412 Beacon Street,
Boston

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

To the Editor In addition to the articles enumerated in our letter of December 4, the following have been accepted:

Mallinckrodt Chemical Works
Hippuran, 100 gm. bottle
Hippuran, 500 gm. bottle

Sharp & Dohme
Rabies Vaccine (Phenol Killed) (Semple) 14 dose package, with syringe

John Wyeth & Brother, Inc.
Vaginal Suppositories Silver Picrate—Wyeth's, 1 gr (infant size)

PAUL NICHOLAS LEECH, *Secretary*

535 North Dearborn Street,
Chicago, Illinois

MEDICAL SERVICE IN CHINA

To the Editor The Emergency Medical Committee for China of the Foreign Missions Conference of North America has been set up for the purpose of finding a group of

selected young surgeons for service in China to relieve the terrific pressure put on existing medical institutions in caring for war wounded. The need for immediate assistance can hardly be exaggerated, as many thousands of soldiers and civilians are undergoing untold suffering, being still uncared for in every way.

I am taking the liberty to ask your assistance in canvassing for available young men with surgical experience—married or single—who could go out alone for at least one year for such service as above indicated.

This committee is offering expenses paid to and from the Far East, and a salary equal to the average now being paid to medical workers in China.

We shall especially appreciate the recommendation of individuals who you think would be suitable and interested in humanitarian service, and I shall be glad to arrange for personal interviews, either here or elsewhere, with any candidates that you might recommend.

S H LILJESTRAND, M.D.,
Executive Secretary

Room 811, 150 Fifth Avenue,
New York City

RECENT DEATHS

LARSON—CARL G LARSON, M.D., of 119 High Street, Medford, died December 23. He was in his forty third year.

Dr Larson received his degree from the College of Physicians and Surgeons in Boston in 1927.

He was a fellow of the Massachusetts Medical Society and a member of the American Medical Association.

LEARD—JOHN S LEARD, M.D., of West Roxbury, died at his home, February 3, after a week's illness. He was in his seventy second year.

A native of Prince Edward Island, he graduated from Prince of Wales College and received his degree from the University of Pennsylvania School of Medicine in 1894.

Dr Leard was a member of the original staff of the Faulkner Hospital and was organizer and first president of the West Roxbury Roslindale Jamaica Plain Medical Association. He was a fellow of the Massachusetts Medical Society and the American Medical Association. At the time of his death he was vice president of the Jamaica Plain Dispensary and a member of the Clinical Club of Boston and of the Norfolk District Medical Society of which he was a past president, councilor and censor.

Among his other affiliations were memberships in the Masonic Order, the Unitarian Club of West Roxbury, the Emmanuel Men's Club and the Highland Club of West Roxbury.

His widow, a daughter and twin sons survive him.

REPORT OF MEETING

NEW ENGLAND HEART ASSOCIATION

The regular monthly meeting of the New England Heart Association was held at the Peter Bent Brigham Hospital on January 24. The following program was presented:

THE DEVELOPMENT OF FATAL LUETIC AORTITIS WITHIN TWO YEARS AFTER PRIMARY INFECTION. Maurice A. Schnitzer, M.D.

The case was that of a Canadian born housewife, age twenty three, who, except for two operations, was cared for in a distant hospital. Married at sixteen, she went through normal pregnancies at seventeen and at eighteen. In the next three years she was hospitalized for breast abscess, acute gonococcal salpingitis and minor illness, during which time three blood tests for syphilis were negative. Examination of the heart during this period was entirely normal. At the age of twenty-one, one and a half years after the gonococcal infection, she contracted syphilis, being seen in the secondary stage of the disease, with Wassermann, Kahn and Hinton tests positive. She was treated for the next seven months, irregularly, with sulfarsphenamine, this was essentially the only treatment received. Six months after the onset of the syphilis, while under treatment, she began to have typical angina pectoris with radiation of pain to both arms and hands. At that time the heart was enlarged, and revealed coarse, systolic and diastolic murmurs of aortic insufficiency and an Austin Flint sound. Nitroglycerin gave some relief. At twenty two, the pains were incapacitating, and she entered the Peter Bent Brigham Hospital where left cervicothoracic sympathectomy was done with temporary complete relief of pain. At this time physical examination and x-ray showed, in addition, a large aneurysm of the aorta. Electrocardiograms revealed only left-axis deviation. Two months later, with severe recurrence of pain in the right shoulder, arm and back, she re-entered the hospital and a right sympathectomy was performed. Pain recurred several weeks later, with severe dyspnea and hemoptysis. She died in an attack of pain at the age of twenty three, two years after the onset of syphilis and eighteen months after the beginning of cardiac symptoms. At necropsy, the heart weighed 790 gm. and showed a huge aneurysm of the aorta, syphilitic aorta insufficiency and practically complete occlusion of the right coronary ostium.

SOURCES OF ERROR IN THE DIRECT METHOD OF VENOUS PRESSURE. Richard H. Lyons, M.D., J. Allen Kennedy, M.D., and C. Sidney Burwell, M.D. Presented by Dr. Lyons.

There is wide variation in the reports of venous-pressure measurements in normal people. This results from a lack of uniformity of methods used and from variations in the position of the reference point. In an effort to define more closely the normal limits of venous pressure, certain sources of error in the direct method have been considered. The position of the site of venipuncture, the bore of the manometer and variations in the physiologic state of the subject may distort the venous-pressure readings. Venous pressures were determined on 90 normal subjects, and the suitability of the reference points of von Recklinghausen, Moritz and Tabora, and Eyster. It was found that the use of reference points involving the thoracic diameter of the subject gave lower venous-pressure readings in subjects with larger chests. This may be eliminated by using the table top as the reference point with the patient in the supine position.

PHYSIOLOGIC EFFECTS OF ARTIFICIAL FEVER. John G. Gibson, 2nd, M.D.

The physiologic effects of artificial fever can be interpreted in light of the great increase over normal in heat exchange. Extreme vasodilatation occurs in the effort to maintain normal temperature, with increase in pulse rate, blood flow, venous pressure and cardiac output, resulting in an increased volume capacity.

Sweating is profuse, and plasma volume reduced, the

degree of reduction being related to the amount of fluids given. Since fluid absorption from the gastrointestinal tract may be retarded, there is a tendency toward a disparity between the volume capacity and circulating volume.

Gross water loss is great, and is determined by the temperature, humidity and air movement of the patient's environment, being least in cabinets in which humidity is highest, dry bulb temperature lowest and air velocity least. Tissue fluid loss is determined by the rate of fluid intake, and a critical level exists for each patient beyond which further loss involves risk of peripheral vascular collapse.

The loss of chlorides in sweat and of carbon dioxide through hyperventilation brings about an alkalosis, the degree of which is related to the degree of dehydration permitted to occur.

Provided water, chlorides and carbon dioxide are administered in amounts adequate for replacement of losses, high temperatures (106.7°F) may be safely maintained for long periods (6 to 15 hr).

THE ANTAGONISM OF HYPERTENSION AND ACTIVE TUBERCULOSIS. A. W. Contratto, M.D.

In approximately 32,000 individuals admitted to the Medical Service of the Peter Bent Brigham Hospital, from 1913 to 1936 inclusive, there were 1250 cases of pulmonary tuberculosis, 761 of which were active.

The average age of the entire group was 42.9 years, of the active male group 40.5 years, and of the active female group 35.5 years.

The average blood pressure determinations in the various decades (second to eighth) were from 10 to 15 mm. lower in both the systolic and diastolic readings in the active tuberculous groups than the considered average pressures of normal persons. There were only 6 individuals, or 0.8 per cent, in the active group who had a systolic blood pressure of more than 160 mm. of mercury, and the majority of these cases were not diagnosed as tuberculosis clinically and even at autopsy there was some doubt as to the activity of the lesion.

There were 4 cases of rheumatic heart disease in the active group. Two of these came to autopsy. One had aortic insufficiency and no mitral stenosis, the other had mitral stenosis only. The other 2 cases were diagnosed as mitral stenosis clinically. In the active group there were no cases of angina pectoris or cardiac infarction.

Three hundred and thirty-two cases came to autopsy. One hundred and twenty-four of these were active cases of pulmonary tuberculosis. The average heart weight was much less in the active than in the healed cases, even in proportion to body weight.

It seems that all forms of cardiovascular disease exist only rarely in persons with active tuberculosis.

OBSERVATIONS ON THE FOURTH LEAD OF THE ELECTROCARDIOGRAM. Roger W. Robinson, M.D., A. W. Contratto, M.D., and S. A. Levine, M.D. Presented by Dr. Robinson.

Nine different chest leads were chosen covering the cardiac silhouette to determine if there was one position which would give reliable information in a great majority of instances and could be used as a standard fourth lead. Five hundred tracings were taken on 350 patients, of whom 76 came to autopsy. The old polarity was used. It was found that an upright T wave occurs frequently along the sternum but only rarely at the apex in normal

hearts When an upright T wave occurs as the only abnormality in the fourth lead, it is not reliable evidence for myocardial infarction Large hearts may show no Q wave in any precordial position, except the apex, without myocardial infarction The Q wave may not disappear for fifteen days after an acute anterior infarction, and then it may disappear only at the apex An absent Q wave at the apex is practically always associated with an anterior myocardial infarction The fourth lead may be correctly interpreted in the presence of auricular fibrillation and delayed intraventricular conduction We believe that the apex should be used as the point of application of the electrode for the standard fourth lead.

NOTICES

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve-thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center All kinds of tumors are seen, discussed, and when indicated, treated with radium and high-voltage x ray

Physicians are welcome to visit this clinic and bring a patient to the clinic for diagnosis

AMERICAN BOARD OF OPHTHALMOLOGY

During 1938 the American Board of Ophthalmology will hold examinations as follows

San Francisco, June 13,
Washington, D C, October 8,
Oklahoma City, November 15

Applications should be filed immediately The required number of case reports must be filed at least sixty days prior to the date of examination Application blanks can be procured from Dr John Green, 3720 Washington Avenue, St. Louis, Missouri

FEVER THERAPY

The Peter Bent Brigham Hospital is now equipped to give fever therapy induced by physical means This is under the immediate supervision of Dr John G Gibson, 2nd Physicians desiring to send patients to the hospital for fever therapy should arrange by telephone with the admitting physician, he will furnish information as to charges for such service Advice in regard to the use of fever therapy, suitability of individual patients for it, and so forth, can be obtained by telephoning Dr Gibson at the Peter Bent Brigham Hospital, he should be communicated with before final arrangement for admission of the patient has been made.

POSTGRADUATE INSTITUTE OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY

The Third Annual Postgraduate Institute, offering an intensive and interesting study of diseases of the digestive tract, will be conducted by the Philadelphia County Medical Society from March 28 to April 1 inclusive.

The program to be held in the Bellevue-Stratford Hotel, Philadelphia, has been designed to meet the needs of all members of the profession, but particularly those in general practice.

Physicians from fourteen states having attended last year's institute, an invitation to attend the 1938 session has been extended to the members of all county societies.

Lecturers have been selected from among the foremost teachers in this great medical center While approaching the subject from specialized viewpoints, the presentations will be of a strictly practical nature and of real value to the general practitioner, who finds that digestive conditions occupy a considerable portion of his time.

The Philadelphia County Medical Society, in conducting the institute, is meeting the demands of many physicians who believe that the organized profession should provide them with this type of opportunity for keeping abreast of medical progress, and thus maintaining the highest standards of medical service.

The only charge is a \$5.00 registration fee to cover the institute's expenses

Additional information may be secured from your county society or from the Philadelphia County Medical Society, 21st and Spruce Streets, Philadelphia.

UNITED STATES CIVIL SERVICE EXAMINATION

Junior Scientific Aid (Parasitology), \$1440 A Year

Applications must be on file with the United States Civil Service Commission at Washington, D C., not later than February 28

Applicants must show that they have had at least two years of experience in a zoological laboratory The required experience must have been full time and paid Applicants may substitute one year of study including a course in zoology, successfully completed in a college or university of recognized standing, for one year only of the required experience.

CAMBRIDGE HOSPITAL

The regular clinicopathological meeting of the staff of the Cambridge Hospital will be held at the hospital, 300 Mt. Auburn Street, Cambridge, on Tuesday, February 15, at 8:30 p. m.

All members of the medical profession are cordially invited to attend.

JOSEPH M. WADDEN, M.D., *Secretary*

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, February 15, at 12 noon.

Dr William Dameshek will speak on "Hematological Problems in General Practice."

All physicians are cordially invited to attend.

JOHN B. HALL, M.D., *Secretary*

NEW ENGLAND PATHOLOGICAL SOCIETY

A meeting of the New England Pathological Society will be held in the amphitheater of the Mallory Institute of Pathology, Boston City Hospital, on Thursday, February 17, at 8:00 p. m.

PROGRAM

Alzheimer's Disease. Dr Naomi Raskin.
The Vascular Pattern in Various Lesions of the Human Central Nervous System. Studies with the benzidine stain. Dr Leo Alexander, Dr T. H. Suh and Dr Tracy J. Putnam.

Time Determination of Histopathologic Changes in the Brain Experimental incisions into the brain with transection of meningeal and intracerebral blood vessels in cats Dr Leo Alexander and Dr Hugh P Newbill.

Physicians and medical students are cordially invited to attend.

J B HAZARD, M.D., *Secretary*

NEW ENGLAND SOCIETY OF PHYSICAL MEDICINE

The regular meeting of the New England Society of Physical Medicine will be held at the Hotel Kenmore, Boston, on Wednesday evening, February 16, at 8 00 o'clock.

Dr Robert S Harris will talk on Medical Application of Radiant Energy Discussion by Dr Franklin P Lowry

The Council will meet at 6 00, and dinner will be served in the Empire Room at 6.30

All members of the medical profession are cordially invited to attend.

WILLIAM D McFEE, M.D., *Secretary*

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

The next meeting of the Boston Society of Psychiatry and Neurology will be held at the Boston Medical Library, Thursday evening, February 17, at 8 15 o'clock

PROGRAM

Chronic Progressive Chorea with Senile Changes in the Cortex and Basal Ganglia Case report. Dr David Rothschild.

The Effect of Benzedrine Sulfate on Sleep, Normal and Drug Induced. Dr Abraham Myerson.

Experiences with Meningiomas of the Brain. Dr Gilbert Horrax.

H. HOUSTON MERRITT M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, FEBRUARY 14

TUESDAY FEBRUARY 15

9-10 a m Boston Dispensary Clinicopathological conference Dr R. C. Wadsworth.

10 a m 12.30 p m. Tumor clinic. Boston Dispensary

12 m. South End Medical Club Headquarters of the Boston Tuberculosis Association 554 Columbus Avenue, Boston

4 p m. Boston Tuberculosis Association Hotel Copley Plaza

5 p m. Cutter Lecture on Preventive Medicine Harvard Medical School Amphitheater Building E.

WEDNESDAY FEBRUARY 16

9-10 a m. Boston Dispensary Hospital case presentation Dr S J Thannhauser

12 m Clinicopathological conference. Children's Hospital Amphitheater

8 p m. New England Society of Physical Medicine Hotel Kenmore Boston

THURSDAY FEBRUARY 17

8.30-9.30 a m Exchange visit, surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Children's Hospital.

9-10 a m Boston Dispensary Hyperventilation Syndromes Dr Maurice Sokolow

4 p m. New England Pathological Society Amphitheater of the Mallory Institute of Pathology Boston City Hospital

8 15 p m. Boston Society of Psychiatry and Neurology Boston Medical Library 8 Fenway Boston

FRIDAY FEBRUARY 18

9-10 a m Boston Dispensary Some Recent Developments in Purpura and Hemophilia Dr Frederick J Poble.

10 a m. 12.30 p m. Tumor clinic Boston Dispensary

12 m Clinical meeting of the Children's Medical Service, Massachusetts General Hospital Ether Dome

SATURDAY FEBRUARY 19

9-10 a m Boston Dispensary Hospital case presentation. Dr S J Thannhauser

10 a m 12 m. Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A Christian

SUNDAY FEBRUARY 20

4 p m. Illustrated public health lecture Faulkner Hospital auditorium. Progress in Dental Surgery Dr Kurt H Thoma

4 p m. Free public lecture. Harvard Medical School amphitheater of Building D Overweight and Underweight. Dr F Dennette Adams.

4 p m. Free public lecture Beth Israel Hospital Boston in conjunction with the Women's Auxiliary Dangers that Lurk in Cosmetics Dr Jacob J Schwartz

Open to the medical profession

FEBRUARY 14 and 15—Congress on Medical Education and Licensure Page 279

FEBRUARY 14—American Board of Internal Medicine Page 969 issue of December 9

FEBRUARY 15—Cambridge Hospital Clinicopathological meeting of the staff Page 282

FEBRUARY 15—Boston Tuberculosis Association. Page 244 issue of February 3 and page - 3

FEBRUARY 15—Cutter Lecture on Preventive Medicine. Page 245 issue of February 3

FEBRUARY 15—South End Medical Club Page 782

FEBRUARY 16—New England Society of Physical Medicine. Notice above

FEBRUARY 17—Boston Society of Psychiatry and Neurology Notice above

FEBRUARY 17—New England Pathological Society Page 282.

FEBRUARY 21—Boston Medical History Club 8 15 p m. Boston Medical Library 8 Fenway

FEBRUARY 22—New York University College of Medicine Alumni Day Page 245 issue of February 3

FEBRUARY 5—Massachusetts Psychiatric Society Page 245 issue of February 3

MARCH 1—Greater Boston Medical Society Beth Israel Hospital auditorium 8 30 p m.

MARCH 3—George Washington Gay Lecture. Page 245 issue of February 3

MARCH 10—Pentucket Association of Physicians Hotel Bartlett 95 Main Street Haverhill 8 30 p m

MARCH 10 11 12—New England Hospital Association. Page 51 issue of January 6

MARCH 28 APRIL 1—Postgraduate Institute of the Philadelphia County Medical Society Page 282.

APRIL 4 8—The American College of Physicians. Page 41 issue of July 1

MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

JUNE 13-17—American Medical Association. San Francisco

JUNE 13 OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 282.

OCTOBER 17 21—Clinical Congress of the American College of Surgeons New York City

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p m New Bedford.

ESSEX SOUTH

MARCH 2—Lynn Hospital Clinic at 5 p m. Dinner at 7 p m. Speaker and subject to be announced.

APRIL 6—Gloucester Hospital Gloucester Clinic at 5 p m. Dinner at 7 p m. Speaker and subject to be announced.

MAY 5—Censors meet at Salem Hospital 3.30 p m

MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p m. Speaker and subject to be announced

FRANKLIN

Meetings will be held at the Franklin County Hospital Greenfield at 11 a m. the second Tuesdays of March and May

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club Stoneham at 12.15 p m on March 16, and May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27

NORFOLK DISTRICT

FEBRUARY 23—Hotel Kenmore. 8 15 p m. Dermatitis Venenata Due to Cosmetics and Industrial Irritants Dr John G Downing Discussion by Dr Francis P McCarthy

MARCH 29—Hotel Kenmore. 8 15 p m Subject to be announced but to be related to diseases of the kidney Dr Albert A. Hornum

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon.

MARCH 3—Norfolk County Hospital South Braintree

APRIL 7—At the Quincy City Hospital

MAY 5—Annual meeting

PLYMOUTH

Meetings will be held at 11 a m on March 17 April 21 May 19 and July 21

SUFFOLK

MARCH 15—Joint meeting with Boston Obstetrical Society

WORCESTER

At the following meetings except the annual meeting dinner will be at 6 15 to be followed by business session and scientific program

MARCH 9—Memorial Hospital Worcester

APRIL 13—Hahnemann Hospital, Worcester

MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced

BOOK REVIEW

Artificial Fever Produced by physical means, its development and application Clarence A. Neymann. 294 pp Springfield and Baltimore Charles C Thomas, 1937 \$6.00

The advance in artificial fever as a means of treatment in many diseases has been so rapid that most of the literature has necessarily appeared in medical journals. Some of this, having been collected and evaluated, is now published in monograph form. The author, Dr Neymann, was one of the pioneer workers in this field, having begun his investigations as early as 1927 and published his first paper September 1, 1929. It would appear that he was the first to use high frequency currents in man for the purpose of treating disease. His work was done originally at the Cook County Psychopathic Hospital and later at the Northwestern University Medical School. His book consists of an adequate historical introduction to the subject, excellent descriptions of the technic of electropyrrexia and well written chapters on the physiology of hyperpyrexia due to various agents, the effects of artificial fever upon diseases such as dementia paralytica, other forms of syphilis, multiple sclerosis, chorea minor, arthritis, gonorrhea and asthma, and finally, an evaluation of his own results as compared with those of others. In addition, he gives an extensive bibliography up to January 1, 1937, listing over 550 references.

The book may be read with many points of view in mind. Those interested in the history of artificial fever will find an adequate account of not only the more recent methods based upon electricity, but the older ones, particularly balneotherapy, used from very ancient times. Of most interest, perhaps, in the historical field are his account of patients bathing in a bath of hot water in Japan, where the body temperature is raised by this method to as high as 104°F, and the forgotten demonstration by Philipps, in 1883, that by immersing himself in hot water, he raised his own temperature to 103°F. Dr Neymann gives Philipps the credit, therefore, of being the originator of hyperpyrexia produced by physical agents.

The physiologist will be interested in the excellent

chapter on the bodily effects of hyperpyrexia, in relation to the velocity of blood flow and on the heart, sodium chloride excretion, blood sugar, and so forth. All these subjects, others, are treated in considerable detail. Another of the book, which concerns the technic of electrical, in charts and photographs as well as with the various types of methods which have in the last ten years. The author has tried out all the methods which are described, beginning with diathermy, first reported in 1929, and followed by thermotherapy, electromagnetic induction, electric blanching heat and hot-air cabinets, with his final in the last two years, of a combination of air-cooled cabinets and electromagnetic induction. This has to be the safest and surest way to raise the temperature of the body and keep it at a constant level as desired.

Finally, the book will be useful to the clinician. There are individual chapters on separate diseases and the results of treatment. Dementia paralytica has a record, for in early cases selected for treatment the recovery rate is very high, perhaps up to 80 per cent. In institutionalized and deteriorated patients, the recovery rate is much lower, but even in this group recovery may reach as high as 30 per cent, and another 30 per cent will show decided improvement. After hyperpyrexia, the use of tryparsamide and other heavy salts is recommended. The results of treating other diseases, of syphilis of the central nervous system are not so satisfactory, although the author believes that, in cases of tabes dorsalis, artificial fever is a safe and practical method of treatment that promptly alleviates the lancinating pains and crises in a large percentage of the cases. In the treatment of primary optic atrophy due to syphilis, in the author's opinion, in an experimental stage, striking results have been obtained. The same may be said of the treatment of primary and secondary syphilis, although improvement is readily noted, it would seem that artificial fever alone will not eradicate the disease. The author is somewhat encouraged by his treatment of cases of multiple sclerosis and feels that the results with hyperthermia are better than those with other forms of therapy. In chorea minor the disease is promptly aborted in the vast majority of the cases, although recurrences may occur in a few after the treatment is over. Dr Neymann feels that artificial fever at present is the treatment of choice for Sydenham's chorea. It also seems to be a specific for the treatment of gonorrhea, but there are other factors to be considered and the elaborate technic of treatment tends to forestall the use of this method when easier forms of treatment are at hand. It is thought, in addition, that electropyrrexia may have some influence on asthma.

In general, it is too early to evaluate this form of treatment in any of the diseases except, possibly, dementia paralytica. The author takes a broad stand on this point in spite of his intensive work on this form of treatment and his great interest in it. Although the subject is advancing so rapidly that this monograph will soon be out of date and require a second edition, nevertheless the book is one of great value for its historical perspective and for its view of the subject at the present time, seen through the eyes of an expert. For the details of treatment, the physiologic effects, and a review of the literature, this book can be highly recommended. The author would be the first to admit that it is not the final word on the subject, for advances have already been recorded since he was able to finish his manuscript, a few months ago.

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THE LOSS OF BLOOD IN CERTAIN STANDARD OPERATIONS FOR MALIGNANT DISEASE

WESTON T. BUDDINGTON, M.D.,* AND GRANTLEY W. TAYLOR, M.D.†

WRENTHAM AND BOSTON

THE determination of the amount of blood lost in operations is of great interest and value. The amount becomes of major importance in a poor-risk patient with malignant disease. A knowledge of the amount lost in certain types of operative procedures not only helps the surgeon to plan the preoperative and postoperative treatment, but also guides him in the choice of a technic.

Relatively little material dealing with this subject has been published. Gatch and Little¹ investigated the amount of blood lost in several of the commoner operations, and presented their results and method in 1924. Collier and Maddock² using the same method, made additional studies to determine what part the loss of blood played in the dehydration attendant upon operations. Recently Pilcher and Sheard³ have reported a varied series from the Mayo Clinic.

The method which we have employed to determine loss of blood is based on that of Gatch and Little,¹ although modified according to the recommendations of Stewart.⁴ Just before operation, from 4 to 6 cc. of blood is withdrawn from a vein and mixed with a few milligrams of heparin. This prevents clotting, without appreciably diluting the blood. Exactly 1 cc. is mixed with known amounts of N/10 hydrochloric acid, to form acid hematin. This constitutes the "standard," generally in a 1:500 dilution.

With rare exceptions, the skin is prepared with 3.5 per cent tincture of iodine. After drying, this is removed with alcohol, to prevent its being absorbed by the sponges and drapes used during the operation, and thus disturbing the calculation of loss of blood. The sponges upon being discarded are dropped into pails of distilled water so that the blood will not dry and cake. All drapes, gowns and instruments stained with blood are washed in distilled water until the hemoglobin

has been extracted. The sponges and linen are wrung dry by being passed through a wringer. Tissues removed from the body are washed free of gross blood. The total volume of the solution of laked blood thus obtained is accurately measured, and a measured sample is converted into acid hematin by the addition of hydrochloric acid. This is compared with the standard in a colorimeter. The amount of blood lost is easily calculated from these data.

As judged by our own control tests and those of others, the method is accurate, possibly within 5 per cent or at most 10 per cent of the actual loss. It is impossible to recover all the blood spilled during a major surgical procedure, except perhaps in transurethral resections of the prostate where all the bloody irrigating fluid can be saved.

Our object was twofold: to ascertain the amount of blood lost in some of our standard operations, and to discover the factors affecting this amount. Incidentally, our studies have emphasized in the surgeon's mind the necessity of hemostasis, and have confirmed the advantage of a given technic and the advisability, at times, of postoperative transfusion. The minimum, maximum and average loss of blood for a variety of operations are shown in Figures 1 and 2.

The wide difference in the 2 cases of vaginal hysterectomy accompanied by perineorrhaphy merits comment. In the case where the loss of blood was slight, the patient had a small uterus, which was easily delivered, and the operation was carried out with close attention to hemostasis. The high loss of 935 cc. occurred in a slightly obese patient who had previously had 4800 r units of radiation applied over the operative area, the resulting fibrosis rendering the operation technically difficult. Pilcher and Sheard³ have reported 1 case of vaginal hysterectomy, with no mention of perineorrhaphy, in which the loss of blood amounted to about 680 cc.

The maximum and minimum figures for abdominal hysterectomy are interesting, both opera-

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tions were performed by the same surgeon. The average of all the cases is close to that of similar ones recorded elsewhere. In almost every case in our series the operation included removal of both tubes and ovaries and the appendix.

There was virtually no difference between the amount of blood lost in a total gastric resection

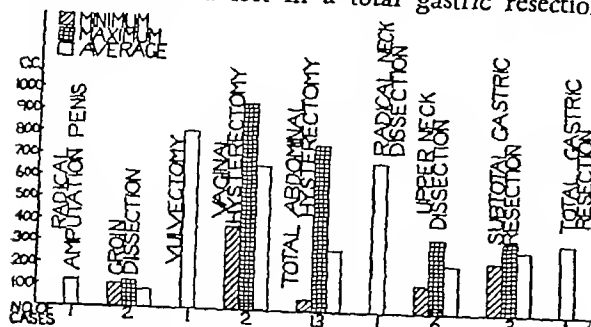


Figure 1 Amount of blood loss in certain standard operations

and that lost in subtotal resections, 2 cases of partial resection are recorded in the literature, one with a loss of 274 cc. and the other with a loss of 232 cc. From all these we may conclude that the desirability of postoperative transfusion in the average gastric resection rests on other grounds than the amount of blood lost at operation.

The results in resection of the rectum are significant. In this procedure we separated the blood

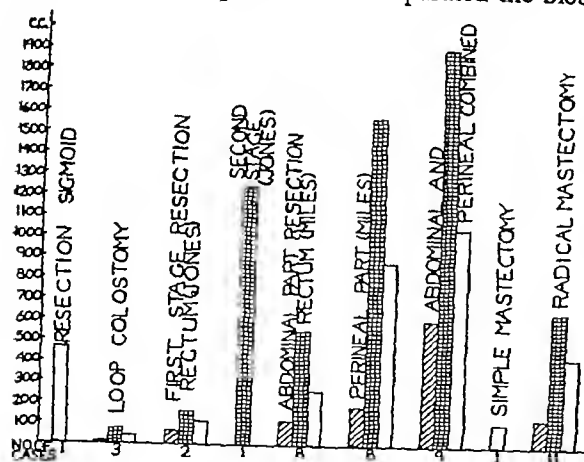


Figure 2 Amount of blood loss in certain standard operations

lost in the abdominal excision from that lost in the perineal. The latter was carried out with the patient either in a lateral position or in that employed for lithotomy. It was at once apparent that most of the loss arose from the perineal excision, even when due allowance was made for blood which had collected in the pelvis in the interval between the two parts of the operation and was thus included in the loss at the time of the second operation. The shock which occasionally developed during the latter part can be

attributed in great degree to this sudden loss of a large amount of blood. The total loss is striking, and strongly supports our policy of giving at least one transfusion, and not infrequently two, in such combined procedures. Our routine practice is to have a continuous intravenous saline clysis started at the beginning of the operation, the citrated blood for transfusion being added when the posterior excision is begun.

The average loss for 11 cases of radical mastectomy, all performed according to the same technique, was 430 cc. We were surprised to find in the literature figures for this operation ranging from 725 to 1272 cc. Our lowest loss (134 cc.) occurred in a radical mastectomy performed on a thin, elderly woman with a small atrophic breast. The average systolic blood pressure during the operation was equivalent to only 70 mm of mercury. Careful attention was given to hemostasis throughout the operation, which lasted one hour and fifty minutes.

The technic employed for radical mastectomy is described elsewhere.⁵ It consists essentially in a modification of the transverse axillary dissection of Rodman.⁶ The important steps which keep the loss of blood at a minimum are: first, sharp dissection with constant traction, which allows the vessels to be clamped before cutting, particularly the many tributaries of the axillary vein and artery; secondly, deferred removal of the sternocostal portion of the pectoralis major muscle and fascia until the remainder of the dissection has been completed. The latter permits the operator to expose the perforating branches of the internal mammary vessels so that they may be clamped before cutting. The amount of blood that spurts from one of these larger vessels in a very short time is considerable.

During the study, record was kept of several factors which it was felt affected the amount of blood lost, for example, the patient's blood pressure and physique, and the speed and skill of the operator. Correlation of these factors resulted in certain general deductions. A high blood pressure during the operation of course increased the rate of blood flow from the ends of severed vessels. Obesity contributed to a higher blood loss in two ways: first, the additional amount of tissue to be dissected necessitated cutting a great many additional vessels; secondly, accurate and secure application of hemostatic clamps was more difficult owing to the friability of vessels in adipose tissue. When all the factors tending to decrease blood loss operate together, the amount may be unusually small, for example, the 134 cc for a radical mastectomy referred to above. The technic and skill of the surgeon and his assistants constitute the most significant factor, often, however, a combination

of adverse circumstances—technical difficulties, obesity, hypertension and the like—more than offset the advantages of an efficient operating team. While the amount of blood lost has a distinct bearing on the development of postoperative shock, other influences are also powerful. The character of the anesthesia, the manipulations, the time consumed by the operation, cooling, the rapidity of blood loss and the general condition of the patient all have an important bearing. It is not surprising, therefore, that we were able to establish only a gross correlation between the amount of loss and the clinical evidence of shock. Many of the other factors, however, are similarly under the control of the operating surgeon, and it is probable that the amount of blood lost serves as a measure of the care and skill with which he has carried out his operation, and of the effectiveness of the precautions he has exercised against the development of operative shock.

SUMMARY

- 1 The loss of blood attendant upon certain standard operations for malignant disease was determined, and the results are recorded
- 2 Factors tending to increase or decrease blood loss are briefly discussed
- 3 Knowledge of the amount of blood lost in certain types of operations aids the surgeon in planning his operative, preoperative and post-operative treatment

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THE USE OF SULFANILAMIDE IN GONORRHEA IN THE MALE

A Preliminary Report and a Warning

WALTER M. BRUNET, M.D.,* CHARLES H. REINHARDT, M.D.,† AND NORMAN D. SHAW, M.D.‡

CHICAGO

THIS preliminary report relates to the use of sulfanilamide as an adjuvant in the treatment of several hundred acute and chronic, anterior and complicated, cases of gonorrhea in the male. We have not depended solely upon sulfanilamide for a cure. In acute anterior infections local injections of a mild antiseptic have been given, and in the posterior cases remedies of proved worth have been administered in conjunction with the compound. A number of these patients have been carefully observed for a sufficient period of time for recognized tests of cure to be carried out before they were discharged, and for an evaluation of the treatment. The patients have not been selected, and the clinical study is still in progress and will be reported in detail at a later date.

Within the past twenty years about a dozen "specifics" for gonorrhea have been proclaimed. The most recent one, sulfanilamide, follows close upon the Corbus-Ferry filtrate, which failed miserably as a cure. Despite reports of remarkable cures from the use of sulfanilamide in gonococcal infections in the male, we believe that this infection will continue for many years to be the medical riddle of the sphinx. We believe that sulfanilamide

is, and should be, regarded only as an experimental and speculative remedy until a larger number of adequately controlled and correlated clinical studies have been reported. The recent papers giving the results of the use of the drug in specific urethritis have been wholly lacking in completeness, and not a single contributor has mentioned adequate controls or extended supervision. Therefore, on the rather meager grounds of insufficient clinical trial and observation the medical profession is deluged with propaganda announcing another cure for gonorrhea. In a recent leaflet one of the large drug houses describes the action of the drug as follows: "In gonorrhea the discharge disappears within a few days, and smears usually become negative within a week." This is quite simple, and with such a medicament there is surely no occasion for the guiding hand of a physician. Several recent reports in the literature have been to the effect that the toxicity of the drug in man and animals is low. We have seen a large number of patients who showed some reaction to it, but whether these manifestations are toxic in origin or are due to an idiosyncrasy is not known.

Within the past few months there have appeared reports of the use of Elixir of Sulfanilamide which has caused scores of deaths, the fatalities were apparently due to the diethylene glycol in which the drug was dissolved. Sulfanilamide is one of

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a large number of chemical compounds which contain the benzene ring, and it is well known that these products and the closely allied phenyl derivatives often exhibit a harmful effect upon the bone marrow and other blood-making organs. Several authors report the successful use of the medication in meningitis, bacteremia of puerperal origin, pneumonia and influenza. However, dangerous and even fatal blood changes such as acute hemolytic anemia, agranulocytosis and sulfhemoglobinemia have followed its administration. While these alterations are not often encountered, they occur with sufficient frequency to demand the most careful observation and control of the patient. The indiscriminate prescribing of sulfanilamide by physicians is to be frowned upon, and its direct sale over the drugstore counter is to be severely condemned.

Sulfanilamide in our hands has not yet proved to be a specific for gonorrhea in any stage of the disease, but we do find that its conservative use has been of benefit in a number of cases. We recommend that not more than 40 gr be taken daily. We prescribe two 5-gr tablets and an equal amount of bicarbonate of soda, to be taken every three hours. Even this small amount causes unexpected symptoms in a number of patients. We suggest that larger doses be withheld until the pharmacology of the drug has been more thoroughly studied and its action understood, for it is possible that its injudicious use may induce mortality in a disease which ordinarily should have none.

In acute anterior gonorrhea we have observed a number of patients in whom the drug produced fairly prompt changes in the character and consistency of the discharge, but organisms were readily demonstrated for many days in the stained slides. We expect about 5 per cent of our patients with an anterior infection to recover from their disease promptly with mild conservative treatment. By the addition of sulfanilamide to our armamentarium this percentage will probably be doubled. However a number of our patients who have taken large doses of sulfanilamide for many days have developed severe complications, such as prostatitis, vesiculitis and epididymitis, and have had a stormy recovery. We have treated others in whom an apparent carrier state was produced, in these the symptoms almost completely disappeared, but there remained a residual watery but persistent urethral discharge in which typical intracellular gonococci were found. These patients afterward respond slowly to any method of therapy.

Sulfanilamide appears to be of value in lessening the pain and discomfort in acute posterior extensions, and in some cases there is an apparent short-

ening of the course of the disease. We have seen several patients with chronic, deep-seated infections which had become stationary under other forms of therapy who began to improve within a day or two after taking the drug. The urethral discharge decreases rapidly, the second-glass specimen of urine clears, the pus content of the prostatic secretion diminishes, and a complete recovery follows. The most striking results we have encountered were in 2 patients with acute gonococcal arthritis. In one young man the symptoms were relieved in twelve hours, the redness and swelling of the wrist and fingers being reduced and the pain entirely relieved, and he made an uneventful recovery. In the second patient there was not quite the same dramatic response as in the first, but a complete recovery was made within a few weeks.

The drug probably acts by causing some change in the organism, which permits phagocytosis, and at the same time the growth of the bacteria is inhibited. In many well-developed anteroposterior infections the drug apparently has no effect on the course of the disease.

We have had a large number of patients with mild reactions. These have consisted of anorexia, gastric distress, headache, dizziness, ringing in the ears, dermatitis and elevation of temperature. One patient stated that he became "unconscious" after taking the drug for twenty-four hours. In 2 cases elevated, reddish-brown skin lesions were observed. In several patients with a dermatitis the eruption was present on the palms of the hands but the mucous membrane of the mouth was not involved.

Sulfanilamide may become a very valuable remedy in urological practice, but overenthusiastic manufacturers must not continue to impose upon the credulity of the general practitioner, on the other hand, skeptical physicians should not minimize the value of the drug without sufficient trial. The place the compound will occupy in medical practice must depend upon time and the unbiased sifting of divergent clinical experiences and opinions. Not until then will it be possible to evaluate correctly the use of the drug in the treatment of gonorrhea. We fear that the unwarranted publicity from pharmaceutical concerns, which is deluging the physicians of the country, may prove so enticing that many practitioners will succumb to these optimistic and alluring statements and not give the careful scientific thought to this new drug that is demanded.

When optimism takes precedence over scientific effort, the scientist is left out of the experiment. The physician should be more analytical of himself and his actions. There is hardly a doubt that we are regressing in our scientific concept of gonor-

rhea and its cure when we permit the glowing but unproved statements in leaflets of chemical concerns to make us cast aside time-honored and reliable measures for something which is said to be

newer and surer. The greater the ignorance, the greater the dogmatism." There is not a physician in this country who would not welcome the day that a true gonococcicide is discovered!

SERUM-PROTEIN STUDIES IN HYPERTHYROIDISM

ELMER C. BARTELS, M.D. *

BOSTON

THE present study of the serum proteins in hyperthyroidism was undertaken because of conflicting reports in the current literature, and in order to obtain additional information regarding the disturbances in general body metabolism in this disease.

Di Benedetto¹ (1933) made a comparative study in 15 normal women and 15 women who had hyperthyroidism and whose basal metabolic rates were more than plus 20 per cent. In cases of hyperthyroidism the value for total protein did not vary from normal, the serum-albumin content was increased a little, the globulin content was increased a little more than the serum albumin, and the albumin-globulin ratio was elevated. He reported that these results were similar to those observed in a dog with hyperthyroidism produced experimentally by the ingestion of thyroid substance. No constant parallelism was found between the variation of the metabolism and the serum-protein content.

Olivetti and Bobbio² studied the proteins of the blood in individuals suffering from disease of the thyroid gland. They reported a tendency to hypoproteinemia with lowering of the albumin-globulin ratio in cases of hyperthyroidism. They attributed this alteration in the value for proteins to a specific influence of the thyroid gland on the regulation of the body-protein mixtures through the neuro-endocrine system.

Labbé, Nepveux and Ornstein³ (1932) reviewed the literature and found conflicting reports. An increase in the total protein content was noted by some observers, changes in the albumin-globulin ratio with an unchanged value for total protein by others, and entirely normal conditions by still others. The study made by Labbé, Nepveux and Ornstein revealed no deviation from the normal. No relation was found between the values for the proteins and the severity of the disease as evidenced by the basal metabolic rate.

Another reason for the present study was to obtain further evidence of changes in hepatic func-

tion in hyperthyroidism. Sufficient clinical and pathological evidence is at hand to indicate that the liver undergoes changes in this disease,^{4, 5, 6, 7, 8, 9} and in recent articles significant changes in the serum-protein content in diseases of the liver have been reported. Tumen and Bockus,¹⁰ in a recent report of the changes in the value for the serum proteins in hepatic disease, corroborated the work of most other observers, who showed a lowering of the serum-albumin content with an elevation of the serum-globulin content and a reversal of the albumin-globulin ratio in this condition. The lowering of the value for serum albumin was the most consistent change noted, elevation in the serum-globulin content and lowering of the albumin-globulin ratio occurred, but were not so constant or significant as the former. This change in the value for serum proteins was thought to be due to alteration in the function of the liver, either in the manufacture of albumin or in the maintenance of its proper level in the blood.

Snell,¹¹ in a recent editorial on the subject of the serum proteins in hepatic disease, asserted that evidence at hand indicated the liver was responsible for the reduction in the plasma proteins, particularly serum albumin. He reviewed experimental evidence that the liver figures strongly in the maintenance of stored and circulating protein. In considering the diagnostic and prognostic significance of the level of the plasma proteins, he concluded that a reversible reaction is apparently possible, since with recovery in the liver the protein content of the serum returns to normal.

MATERIAL

Determination of the serum-protein content by the micro-Kjeldahl method was carried out in 59 cases of hyperthyroidism which exhibited a wide range of toxicity. In 31 cases (Table 1) the level of the total protein was determined on three occasions—on admission to the hospital, just before operation (after a preoperative course of treatment, usually of ten days' duration) and three months after operation, when the usual postoperative determination of the metabolic rate is made. The

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Table 1 Summary of Cases Studied on Admission, Preoperatively and Postoperatively

CASE NO	SEX	AGE	DURATION OF DISEASE	WEIGHT LOSS	ON ADMISSION					PREOPERATIVE					POSTOPERATIVE				
					BASAL METABOLIC RATE %	HIPURIC ACID gm	PROTEINS			BASAL METABOLIC RATE %	HIPURIC ACID gm	PROTEINS			BASAL METABOLIC RATE %	HIPURIC ACID gm	PROTEINS		
							ALBUMIN gm per 100 cc	GLOBULIN gm per 100 cc	TOTAL gm per 100 cc			ALBUMIN gm per 100 cc	GLOBULIN gm per 100 cc	TOTAL gm per 100 cc			ALBUMIN gm per 100 cc	GLOBULIN gm per 100 cc	TOTAL gm per 100 cc
1	F	30	2	20	+49	2.16			6.3	+21	2.84			6.0	+8				7.9
2	F	39	12	12	+17	2.83	3.6	3.15	6.8	+17	2.94	3.29	3.25	6.6	+5	3.13			8.8
3*	F	52	24	15	+40	0.89	3.9	2.3	6.3	+28	1.97	4.1	2.4	6.6	-4	3.03			8.7
4	M	21	12	10	+53	2.36	3.6	3.6	7.3	+35	2.96			8.2	-6	3.09	5.3	1.9	7.3
5	F	32	5	19	+26	2.45			6.3	+16	2.88	3.5	3.0	6.6	-8	3.01			7.5
6	F	36	6	17	+44	1.35			5.3	+38	2.26			5.4	-16	3.16			7.0
7	F	55	48	80	+21	1.49	4.0	2.0	6.0	+17	1.22	3.9	3.6	7.5	-10		4.5	3.4	8.0
8	F	33	1	20	+54	1.69	4.3	1.9	6.1	+28	2.08	5.1	2.0	7.1	-3		5.3	1.8	7.4
9	F	27	24	None	+76	2.31			6.4	+51	2.79	3.0	3.0	6.1	+5	3.0			8.0
10	F	25	12	9	+68	2.50			5.7						+2	3.02			9.0
11	F	22	2	None	+18	2.62	3.2	2.8	6.1						-5	3.97			7.8
12	F	32	5	10	+44	1.07			6.4	+19	2.32			7.6	-15	3.27			8.2
13	F	62	4	20	+32	2.18			5.5	+37				6.8	-6	3.08			7.8
14*	F	61	36	20	+44	2.11			6.4	+27	2.01			6.8	-3	3.10			7.3
15	F	55	4	32	+66	1.65			6.3	+32	2.60			4.9	-14				8.0
16	F	48	8	30	+30				6.8	+16	2.75				-19	4.61			7.2
17	F	36	1	29	+32	1.70			6.0	+24	1.62			6.7	-13	2.16			7.9
18	F	46	8	20	+26	1.98			6.8	+16	1.26			6.4	-5				8.2
19	F	46	3	20	+56	1.28			5.8						+3				6.8
20	F	46	48	3	+44	2.54	4.1	2.80	6.9						-15		4.1	3.6	7.7
21	F	43	30	22	+53	2.07	4.4	2.6	7.0	+52	3.02	4.5	2.0	6.5	-10				8.7
22	F	39	8	30	+90	3.20				+6	3.14	4.0	2.0	6.1	+6				7.7
23	F	53	3	21	+56		2.6	3.1	5.7	+33				5.3	-7	2.70			6.6
24	F	34	10	20	+67	3.10			5.8	+34	2.99			7.7	-13	3.0			7.6
25	F	32	12	7	+22				7.5	+19				6.7	-4				8.6
26	M	57	24	15	+36	1.71			5.7						+7	3.12			7.2
27*	M	59	6	None	+24									5.4	+14				8.7
28*	F	43	12	None	+43	2.33	4.3	2.1	6.4	+37	2.71	4.6	1.9	6.6	-10	3.43			9.8
29	F	54	24	None	+43				7.2	+19				6.6	-5				7.5
30	F	31	6	8	+44		2.6	3.6	6.1	+29		3.0	2.6	5.7	-12		5.1	1.7	6.8
31	F	28	8	25	+80				5.0	+50				6.9	-8				7.4

Adenomatous goiter

Table 2 Summary of Cases Studied on Admission and Preoperatively

Case No	Sex	Age	Duration of Disease	Weight Loss	ADMISSION STUDIES					PREOPERATIVE STUDIES					Notes	
					Basal Metabolic Rate %	Hippuric Acid gm	PROTEINS			Basal Metabolic Rate %	Hippuric Acid gm	PROTEINS				
							Albumin gm per 100 cc	Globulin gm per 100 cc	Total gm per 100 cc			Albumin gm per 100 cc	Globulin gm per 100 cc	Total gm per 100 cc		Albumin Globulin Ratio
1	F	20	8	13	+98	0.92	3.0	2.9	6.0	+55	1.37	3.2	3.3	6.5	0.9	
2	F	16	12	14	+33	1.42	3.5	2.7	6.2	-4	1.45	4.3	2.5	6.8	1.7	
3*	F	66	72	20	+28	0.54	3.8	1.3	5.2	+10	0.67	3.8	2.3	6.0	1.6	
4	F	52	36	None	+46	1.46	4.7	2.4	7.2	+32	2.57	4.7	2.4	7.1	1.9	
5*	F	57	12	15	+40	2.11	3.9	3.2	7.1	+38	1.79	4.5	3.1	7.7	1.4	
6	F	63	4	26	+50		3.7	2.3	6.0	+37	2.45	4.1	3.5	7.6	1.0	
7*	M	45	5	15	+54	2.89			5.8	+39	2.99	3.9	1.9	5.9	1.9	
8	F	60	24	10	+21	1.97			4.9	+11	1.79	4.1	3.3	6.4	1.7	
9	M	29	12	35	+48	1.48			7.1	+29				7.3		
10	F	45	10	None	+49	0.94			5.5	+30	2.90			7.8		
11	F	37	24	None	+41	2.22			7.6	+31	1.92			6.6	1.3	
12	F	32	10	35	+47	0.93			6.7	+30	1.72			7.0		
13	F	31	18	None	+88	1.44			6.9	+55	2.93			5.6		
14	F	29	5	26	+48				6.5	+29				7.1		
15	M	39	18	None	+19	2.37			8.3							
16	M	62	6	71	+80	2.64			7.2	+65	3.04	3.7	3.6	6.9	0.68	
17	F	47	18	17	+33	2.30	2.9	3.0	6.1							
18	F	54	24	30	+29	2.39			5.2							
19	M	54	14	50	+63	2.24			6.5							
20	F	31	5	4	+46	1.75			6.2	+25	2.49			6.5		
21	F	53	4	12	+51	1.93			6.5	+28	2.51			6.9		
22	F	33	6	10	+17	2.26			7.4							
23	F	30	36	30	+39	2.31			6.7	+15	2.79			6.7		
24	M	44	2	40	+34	2.65			5.8							
25	F	64	7	12	+28				7.3	+6				6.2		
26	F	38	12	70	+72		2.7	2.9	5.8	+35				6.9		
27	M	37	24	50	+45				7.5	+20				5.4		
28	F	63	12	42	+66				6.7	+26				6.7		

Adenomatous goiter

serum-albumin and serum-globulin contents also were determined separately on admission in 11 cases, just before operation in 10 cases and three months after operation in 5 cases. In an additional group of 28 cases (Table 2) the total serum-protein content was obtained on admission and before operation, but not after operation. The serum-albumin and serum-globulin contents were determined separately on admission in 8 cases and pre-operatively in 9. The determination of the serum

RESULTS

The average total protein content determined on admission to hospital in 43 cases of primary hyperthyroidism was 6.3 gm for each 100 cc of serum, in 14 cases of adenomatous goiter the value was the same. The effect of hyperthyroidism on the total serum-protein content is apparently the same in both types of disorder.

The distribution of cases and the range of determinations of the total serum-protein content

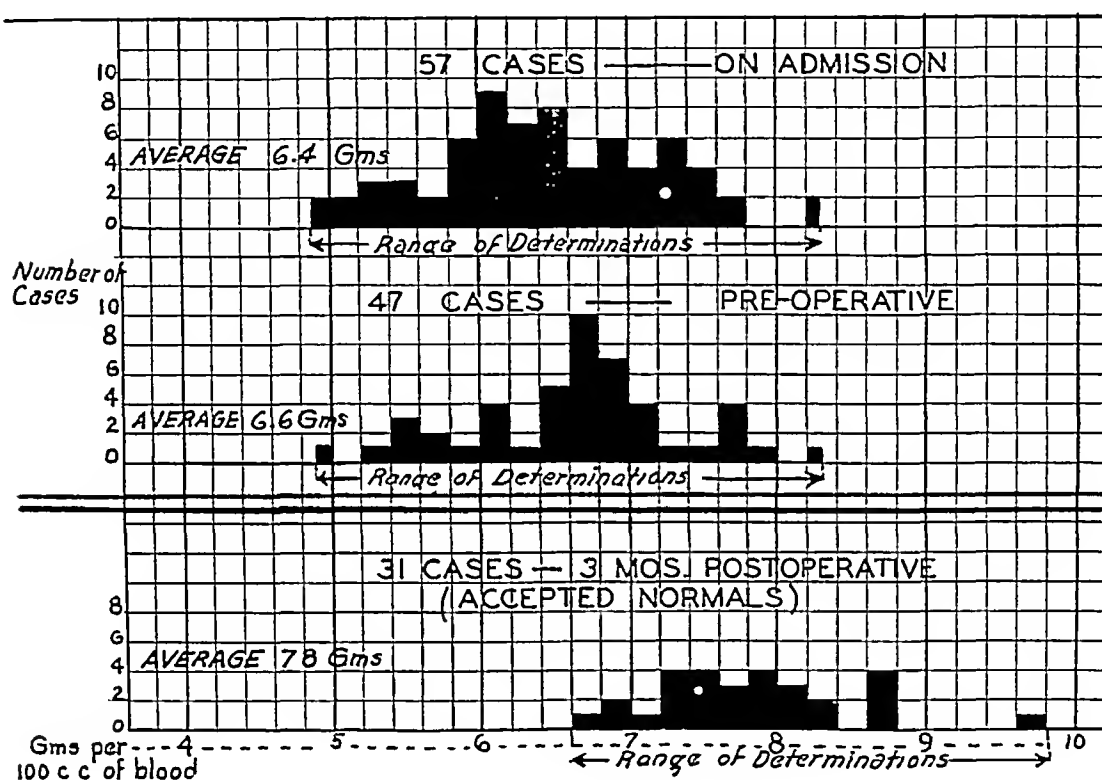


Figure 1 Total serum protein content

proteins on examination three months after operation (Table 1) may be considered to represent a control series, since by this time the patients had regained their health and the basal metabolic rate had returned to normal. That this assumption is correct is also shown by the fact that the determinations made at this time were well within the range of normal according to laboratory standards.

A study of the hepatic function by means of the excretion test of hippuric acid by the method of Quick^{12, 13} was carried out in most of the cases in this series, as indicated in Tables 1 and 2. This procedure permitted a comparison of two observations relating to the condition of the liver in the cases studied.

on admission, immediately before operation and three months after operation are shown in Figure 1. It should be remembered that the determinations made three months after operation were carried out at a time when the patients had recovered from the disease and were considered normal. The average level for total serum protein on admission was 6.4 gm for each 100 cc, with a range of from 4.9 to 8.3 gm. In 63 per cent of the cases the values for the total serum proteins were below 6.6 gm., which is the lowest level in the normal range. In only 1 case was the level for total serum protein above the average normal of 7.8 gm.

The determinations made after the ten-day pre-operative preparation showed that little change had taken place during this period. The average

value was 66 gm, and the range of determinations remained the same. An increase in total serum protein content occurred in 47 cases, however, and at this time in only 37 per cent were the determinations below 66 gm.

Three months after operation the range of the total serum-protein determinations in 31 cases was found to be between 66 and 88 gm, with an average of 78 gm—a normal variation and an average value.

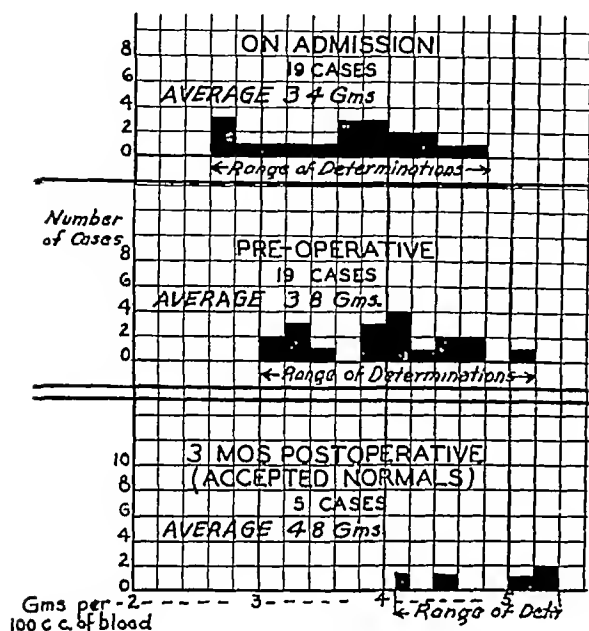


Figure 2 Serum-albumin content

The serum-albumin (Fig 2) on admission ranged between 26 and 47 gm, with an average of 34 gm for each 100 cc. In 73 per cent (14) of 19 cases the determinations were below 41 gm, the lowest figure in the normal range. Before operation the average serum-albumin content was 38 gm, with a range of from 3 to 51 gm.

At this point in only 52 per cent (10 of 19 cases) were the determinations below the accepted normal value. The average serum-albumin content three months after operation was 48 gm, with a range of from 41 to 53 gm.

The average serum-globulin content (Fig 3) was found to be practically the same on admission, before operation and three months after operation. The figures were 26, 26 and 25 gm., respectively. With one exception the range also remained the same in the three instances. A single determination made on admission was 1.3, compared to the lowest normal of 1.7 gm.

The average albumin-globulin ratios, expressed as the figure obtained by dividing the amount of albumin by that of globulin, were 1.4 and 1.5, respectively, on admission and before operation as

compared to the normal average of 2.2 (Fig 4). Hence, the range was reduced on admission and preoperatively, the low figure on admission was 0.8.

No parallelism was found between the level of the serum proteins and the duration of the hyperthyroidism or the amount of weight lost during the course of the disease. In patients who had had hyperthyroidism for only a few months, the levels for proteins were as low as in those who had had it for years. As for the relation of serum-protein content to loss of weight, the patient who had the highest total serum-protein content—8.3 gm.—had not lost weight, on the other hand, the patient with the lowest protein—4.9 gm.—had lost only 10 lb.

No relation was found between the level of the total serum protein and the degree of elevation

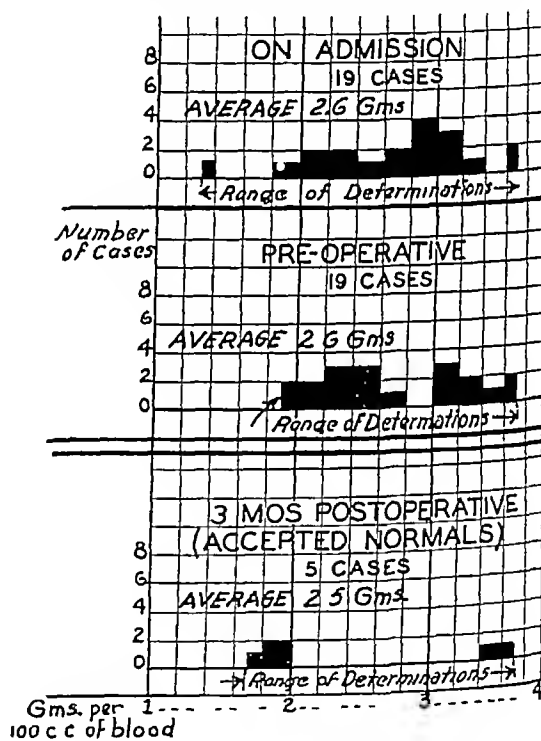


Figure 3 Serum globulin content

of the basal metabolic rate. But in comparing these two factors certain features were noted. In some of the cases of severe adenomatous goiter the basal metabolic rate was only slightly elevated and the total serum-protein content was moderately low. It has nevertheless been recognized that the basal metabolic rate in cases of adenomatous goiter with hyperthyroidism does not always indicate the degree of toxicity, as it does in primary hyperthyroidism. Again, of the 3 patients in whom the value for the total serum proteins was only slightly reduced and the basal metabolic rates were high,—more than plus 70,—2 had

not lost weight and I had diabetes mellitus as a complicating factor. It has been recorded in a recent paper¹⁴ that the hepatic function is not greatly disturbed in cases of hyperthyroidism which are complicated by the presence of diabetes.

The excretion test of hippuric acid by the method of Quick has received considerable clinical trial as a means of determining the functional capacity of the liver, and has proved satisfactory. Since

test determines a specific type of hepatic function, and that excretion test of hippuric acid is an index to the function concerned with carbohydrate metabolism (glycogenic function), while the level of serum protein is an index to the function concerned with protein metabolism (proteogenic function).

RELATION OF SERUM-PROTEIN LEVEL TO SEVERITY OF HYPERTHYROIDISM

When study of a case of hyperthyroidism shows unusual severity of the disease, subtotal thyroidectomy should be performed in two stages rather than in one. As this decision is of utmost importance to the patient and is conditioned by the clinician's opinion, a further search for some criterion was carried out by comparing the level of the total serum proteins on admission with the type of surgical procedure performed. In Figure 5 it is shown that of the 25 cases in which

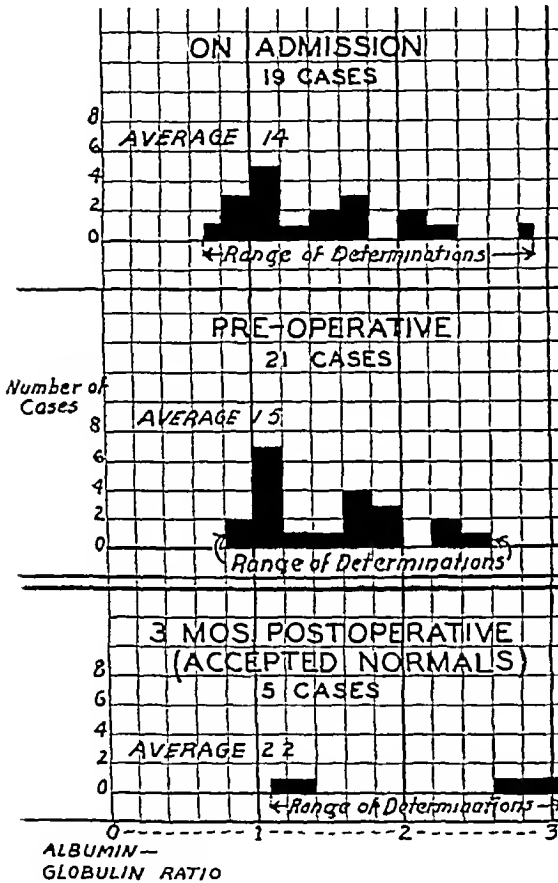


Figure 4 Albumin globulin ratio

the levels for the serum proteins gave information as to the condition of the liver, it was suspected that there might be a corresponding change in the two tests. It was found that the relation was only approximate. In 12 cases of hyperthyroidism in which the values for total serum proteins were below 6 gm per 100 cc, the value for excretion of hippuric acid was 1.95 gm., as compared with 9 cases in which the total serum-protein content was more than 7 gm and the average excretion of hippuric acid was only slightly greater, 2.11 gm.* This failure to demonstrate a direct relation is difficult to explain. It may be, of course, that each

*The normal value for the excretion of hippuric acid is approximately 3 gm.

NUMBER OF CASES	TYPE OF OPERATION	AVERAGE SERUM PROTEIN IN MGS.	NUMBER OF CASES HAVING TOTAL SERUM PROTEIN BELOW 6 MGS.
25	SUBTOTAL THYROIDECTOMY	6.5	4 (16%)
32	HEMI-THYROIDECTOMY	6.2	11 (34%)

Figure 5 Serum protein content in cases in which subtotal thyroidectomy or hemithyroidectomy was carried out

hyperthyroidism was sufficiently mild clinically to permit subtotal thyroidectomy, the average total serum-protein content was 6.5 gm per 100 cc. In only 4 cases, or 16 per cent, was the total protein content less than 6 gm. In 32 cases in which the hyperthyroidism was of sufficient severity to require a hemithyroidectomy as the first operation, the average value for total serum protein was 6.2 gm per 100 cc, in 11 of these cases, or 34 per cent, the total serum-protein content was less than 6 gm. Again, of the 15 cases in which the total protein content was less than 6 gm., hemithyroidectomy was done in 73 per cent. This indicates a direct relation between the clinical severity of the hyperthyroidism and the level of the total serum protein.

In 5 cases (Table 1, Cases 23 and 30, Table 2, Cases 1, 17 and 26) the serum-albumin content was 3 gm or less, the lowest total being 2.6 gm. Primary hyperthyroidism was present in 4 cases, adenomatous goiter with hyperthyroidism in 1, and in all 5 cases two operations were performed. The average basal metabolic rate in these cases was plus 61 per cent, plus 44 was the average for the entire series. The average values for total serum

value was 66 gm, and the range of determinations remained the same. An increase in total serum protein content occurred in 47 cases, however, and at this time in only 37 per cent were the determinations below 66 gm.

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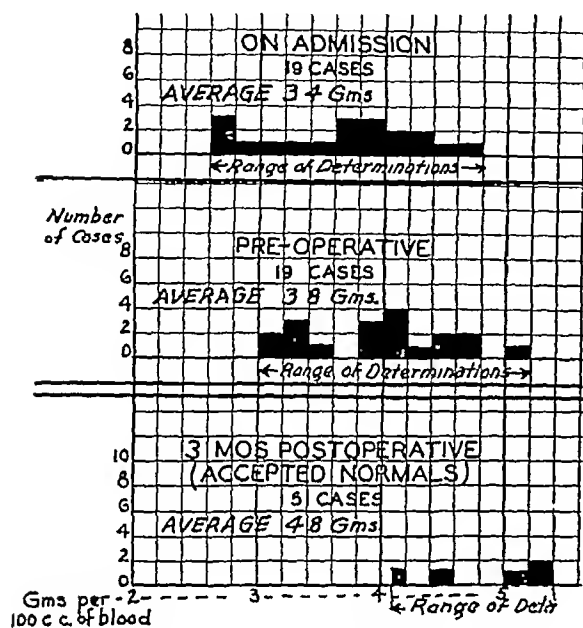


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The average albumin-globulin ratios, expressed as the figure obtained by dividing the amount of albumin by that of globulin, were 1.4 and 1.5, respectively, on admission and before operation as

compared to the normal average of 2.2 (Fig 4). Hence, the range was reduced on admission and preoperatively, the low figure on admission was 0.8.

No parallelism was found between the level of the serum proteins and the duration of the hyperthyroidism or the amount of weight lost during the course of the disease. In patients who had had hyperthyroidism for only a few months, the levels for proteins were as low as in those who had had it for years. As for the relation of serum-protein content to loss of weight, the patient who had the highest total serum-protein content—83 gm—had not lost weight, on the other hand, the patient with the lowest protein—4.9 gm—had lost only 10 lb.

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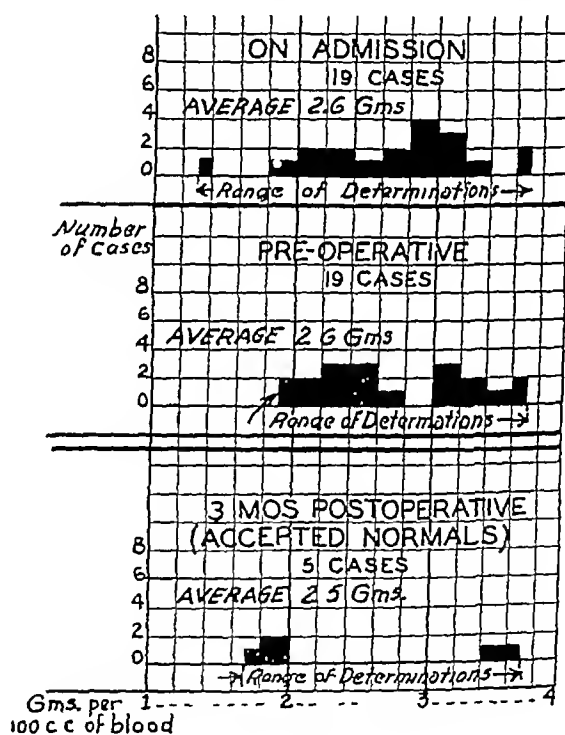


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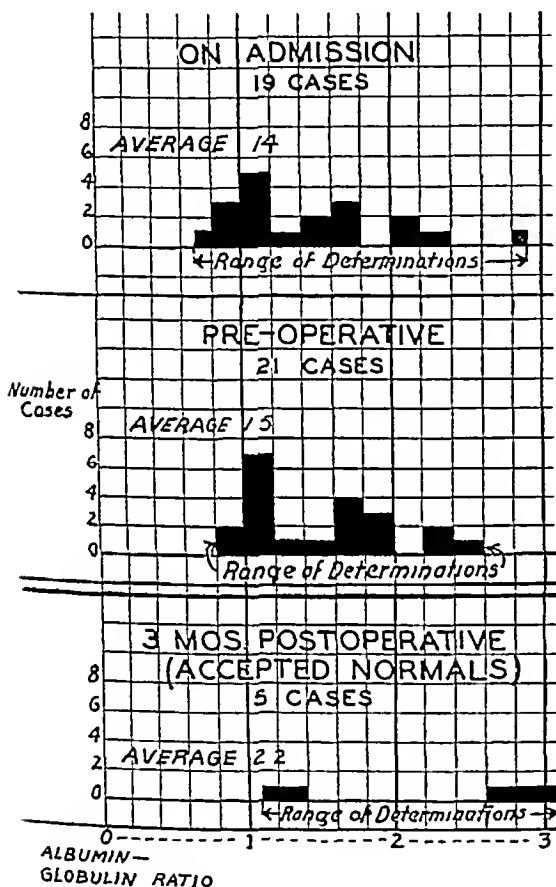


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protein, serum globulin and the albumin-globulin ratio were 5.9 gm, 3.1 gm and 0.9, respectively. This lowering in the serum-albumin content with slight elevation of the level for serum globulin and reduction of the albumin-globulin ratio indicates what a marked alteration may occur in the serum-protein content in cases in which severe grades of hyperthyroidism are present.

SUMMARY

Analysis of the data presented indicates that marked alterations occur in the serum-protein content of cases with clinical hyperthyroidism. In this series the average value for total serum protein was 6.4 gm per 100 cc on admission to the hospital, in 63 per cent of the cases the determinations were below the normal range. Improvement occurred after ten days of preoperative treatment, when the determinations were below normal in only 37 per cent. Three months after operation in all cases the value for the total serum protein was normal. The serum-albumin content in 73 per cent of cases was below normal on admission, the average being 3.4 gm. Preoperatively, the serum-albumin content was below normal in 53 per cent, with an average of 3.8 gm, and in all cases it was normal three months after operation. No apparent change from normal was noted in the serum-globulin content on admission, and preoperatively the average albumin-globulin ratio was reduced to 1.4, three months after operation it was 2.2, a normal ratio.

No direct relation was found between the level of the serum proteins and duration of hyperthyroidism, basal metabolic rate, amount of weight loss or type of hyperthyroidism. A rough correlation was found between the level of the total serum protein and the excretion of hippuric acid, used as a test of hepatic function.

A relation was found to exist between the level of the total serum protein and the severity of hyperthyroidism, as indicated by clinical opinion as to the need for a one-stage or a two-stage operation. In 73 per cent of the cases in which the value for the total serum proteins was below 6 gm., a two-stage operation was required. Furthermore, in all cases in which the serum-albumin content was 3 gm or less, two-stage operations were required.

The changes noted in the serum proteins may be attributed to disturbances in the function of the liver. Changes in structure and in the function of the liver have been noted in cases of hyperthy-

roidism, and the protein disturbance may be accepted as further evidence of this hepatic change. It is unlikely that the alteration in serum protein is on a nutritional basis, since patients with hyperthyroidism usually eat more food of all kinds than do normal individuals. In hyperthyroidism an increase in the blood volume is found, this being attributed to an increase in the body's need for oxygen. Such a change might be said to produce the lowering of the serum proteins, but this does not seem likely inasmuch as there are parallel increases in both the plasma and cells, as evidenced by normal hematocrit values.

This deviation of serum-protein content from normal may have physiological effects on the body as a whole. It may be responsible for the edema in cases of hyperthyroidism that is not caused by cardiac or renal insufficiency, since in some of these cases the total serum-protein content fell below the critical level. There is a possible relation between serum-protein content and postoperative thyroid crisis.

On the basis of the changes in the values for serum proteins in hyperthyroidism, a part of the preoperative treatment of this disease should perhaps be a high-protein diet. It is admitted that failure has been reported in attempts to alter the serum proteins in cases of cirrhosis of the liver by giving a diet high in protein, in hyperthyroidism, however, a functional rather than a fixed pathologic condition exists, as is evidenced by a return to normal in the serum proteins three months after operation.

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A CASE OF HEMOCHROMATOSIS WITH DEGENERATION OF THE HEART MUSCLE AND DEATH FROM CONGESTIVE HEART FAILURE

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THE peculiar disturbance of pigmentary metabolism known as hemochromatosis usually gives rise to the clinical picture of bronzed diabetes with hepatic cirrhosis, because the process affects preponderantly the pancreas, liver and skin. While the heart muscle is involved in the process in 50 per cent of the cases, and while in many of these there is undoubtedly a certain amount of damage to the cardiac musculature, only rarely is this damage sufficient to lead to pronounced cardiac failure. In the case here presented this complication did occur. The patient was on the service of Dr. William F. Collins, to whom we are indebted for the opportunity to examine the patient and report the case.

CASE REPORT

J. C. B., a retired plumbing contractor 54 years of age, a widower and a native of the United States, was admitted to Hospital of St. Raphael, January 7, 1937. His chief complaint on entrance was cough, and swelling of the entire body. He had been in fairly good health until about a year before admission. At this time he developed a short, nonproductive cough which was especially bad at night. About 9 weeks before admission this cough became worse, though still nonproductive, and sleeplessness and orthopnea developed. There was some substernal pain, which disturbed the patient but was never very severe. About 8 weeks before admission swelling of the feet and ankles was noted, this gradually spread until it involved the subcutaneous tissue of the entire body. During this time the urine was scanty, but the patient had no dysuria or hematuria. He had had no indigestion, and the bowels were normal. There was no loss of weight. For the preceding 2 years he had noticed a scaly condition of the skin, with brownish discoloration.

There was nothing significant in the family history except that the patient's father died at 72 of acute cardiac failure. His earlier history was noncontributory. He was at one time a plumber, but for many years had been a plumbing contractor, so that lead poisoning was improbable, there was no history of exposure to copper. He had been unusually healthy most of his life.

Physical examination showed a well-developed man. The face was puffy, and there was generalized edema all over the surface of the body. The breath was urinous. The tonsils were atrophic. The tongue was clean and moist. There was dullness to flatness at the bases of both lungs posteriorly, especially on the right side, with absence of tactile and vocal fremitus. Moist rales were heard over the upper parts of both lungs. The heart appeared to be somewhat enlarged to the left. The sounds were of only fair quality, there was a systolic murmur

with its maximum over the lower end of the sternum, which was heard also along the right sternal margin. The blood pressure was 132/102. The abdomen was protuberant, there was dullness in the flanks, and the abdominal organs could not be palpated. There was moderate pitting edema of the extremities. The skin was dry and showed a bronzed pigmentation.

Dr. Collins's note on January 6, the day before admission, confirmed these findings. He noted that the patient was apathetic, that the thyroid appeared to be slightly enlarged, that the heart was considerably enlarged and the sounds rather feeble, that the abdomen was tender, especially in the right upper quadrant and that the skin was dry, scaly and deeply pigmented. At this time 400 cc. of clear fluid was removed from the right chest.

On January 19 the patient was seen by one of us (G. B.) in consultation. It was noted that there was pigmentation of the skin involving the entire trunk, the arms, face and legs, especially the upper part of the thighs. The pigmentation was brown but was not uniform. There were areas of less pigmented skin scattered over the body between areas of more deeply pigmented skin. There were small patches of slightly pigmented mucous membrane on the inner aspects of both cheeks. There was marked gingivitis, but no lead or bismuth line. The neck veins were prominent, there was cyanosis of the ears and lips, there were signs of fluid in both pleural cavities, and there was a fair amount of moisture at the lower parts of both lungs. The cardiac impulse was feeble, diffuse and in the fifth space, 9.5 cm. to the left of the median line. The first sound was of poor quality and the sounds at the base were very feeble. The pulse was regular in rate but was small and easily compressible. The abdomen was distended and dull in the flanks, and the abdominal organs could not be palpated on account of this distention. There was marked edema of the genitalia, and marked pitting edema of the legs and thighs. The patient had no fever.

The urine had a specific gravity of 1.020, it contained a slight trace of albumin and of sugar, but microscopically only urates. The basal metabolic rate was -23 per cent. The hemoglobin varied from 80 per cent on admission to 70 per cent, 10 days later. The red-blood-cell count was 5,000,000 on admission and fell to 4,400,000, 10 days later. The leukocytes numbered 12,800 on admission and 18,600, 10 days later, with polymorphonuclears 75 and 81 per cent respectively, the remaining cells being lymphocytes. The fluid from the chest showed no organisms, smears and cultures were negative. The nonprotein nitrogen on two occasions was 48 mg. per cent. The blood Kahn reaction was negative. The blood sugar was 140 mg. per cent on admission, and 200 mg. 10 days later.

The patient gradually failed, and died on January 30.

It was noted that the main difficulty was circulatory, that the man was suffering from pronounced congestive heart failure, which did not respond to ordinary methods of treatment, and that the history of substernal pain suggested the possibility of coronary-artery disease. It was thought that the congestive failure was caused by arteriosclerotic heart disease. This diagnosis did not of course explain the pigmentation, in the discussion of this

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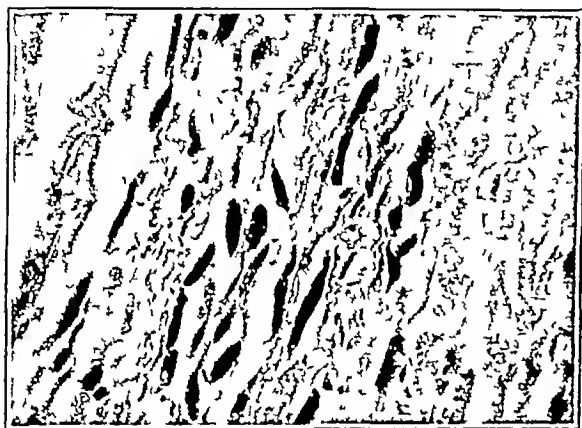
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it was pointed out that the blood pressure made the diagnosis of Addison's disease extremely unlikely, and that a diagnosis of hemochromatosis was indicated, especially in view of the trace of sugar in the urine and the high blood sugar content.

The autopsy was performed by one of us (R. R. N.) on January 30. The important anatomical diagnoses and the chief items of interest in the gross and microscopic examinations of the organs mainly affected by the disease follow.

"Anatomical Diagnoses hemochromatosis of the spleen, pancreas, liver, skin, thyroid gland and lymph nodes, hemochromatosis of the heart with marked fibrosis, cirrhosis of the spleen and liver, cardiac mural thrombi, acute pulmonary and visceral congestion with pulmonary hemorrhage, pericardial and bilateral pleural effusion, ascites, generalized pitting edema, chronic passive congestion of the viscera, early arteriosclerosis.

'The heart weighs 410 gm. The pericardial surface is



Heart Muscle (enlarged from 400 X, G and H filters, phosphotungstic acid and hematoxylin stain) The pigment infiltration, the fractionating of myofibrils and connective-tissue proliferation are shown. In the outer edges, on either side, are shown fibrils which still retain some of their cross striations although the pigment granules are seen within the fibrils, in the center the complete replacement of fibrils by pigment and their massive destruction are well demonstrated.

smooth. There is a very noticeable brown pigmentation. The coronary arteries are moderately thickened, but there are no demonstrable occlusions. The coronary veins are congested and dilated. The myocardium is rather soft and flabby. On section, the myocardium is deep-brown and shows intense streaking and scarring, also noticeably brown. The right side of the heart is markedly dilated. In the right auricular appendage is a large, well-organized, adherent gray-red clot. There is a similar clot in the left auricular appendage. The remainder of the endocardium is smooth, and the valves are all free and appear functionally normal. No vegetations are demonstrable.

Microscopic examination shows that the epicardial fat is normal. The coronary arteries show a slight intimal proliferation without any medial changes, no vessel can be found in any section which is appreciably diminished in caliber. The myocardium is characterized by an intense pigment infiltration of the myofibrils, with degeneration and replacement fibrosis. This pigment gives a positive iron reaction. The myofibrils show varying degrees of degeneration, some with slight loss of cross

striations and varying degrees of pyknosis of the nuclei, others with marked fragmentation and dropped nuclei, while practically all show some degree of irregularity of staining. In some instances large deposits of pigment are laid down in lines, apparently within the sheath of the fibrils, while in other foci clumps of pigment granules lie within a fibroblastic mesh, in which may be seen occasional mononuclear phagocytes containing engulfed pigment. The endocardium of the auricle and the auricular appendage is covered by a thrombus, some of which is organized and shows fibroblastic proliferation, while the remainder shows a more recent process in which fairly well preserved erythrocytes are still visible, as compared to the almost completely degenerated cells in the older portions. The veins throughout the sections are intensely dilated by closely packed red cells.

'The spleen weighs 210 gm. The capsule is smooth and dark. The organ is very firm, and on section imparts a gritty feeling through the knife. The cut surface is purplish red, due to congestion, and shows apparent increase of fibrous stroma.

'Microscopic examination shows nothing of note in the capsule. The sinusoids are widely distended by red cells and many mononuclear phagocytes containing engulfed debris and pigment. The endothelial lining cells are in almost all instances loaded with iron-positive pigment, so that some of these cells appear triple their normal size. The lymphoid follicles are obscured by the intense congestion, but otherwise are normal. The arteries show a slight intimal proliferation, more marked than that observed in the heart. The veins are intensely engorged with red cells.

'The pancreas weighs 130 gm. It is a deep mahogany brown. It is firm, and on section this color is present throughout its entire structure. There is no evidence of hemorrhage.

'Microscopic examination shows that the sections of pancreas are essentially brown. Almost all the acinar cells and those of the islets are filled with iron-positive pigment, and the whole islets and large groups of acinar cells are completely degenerated with pyknotic or dropped nuclei. Between the lobules and also in the intra-acinar spaces there is a marked fatty infiltration throughout the sections, while others show focal fibroblastic proliferation replacing portions of the lobules. In this tissue are numerous mononuclear phagocytes with engulfed pigment, and also clumps of pigment, lying free. The islets throughout are seen to be more seriously involved by the pigment infiltration than are the acinar cells. The ducts of the pancreas show desquamation of epithelium, but are otherwise normal. The arteries show a moderate intimal proliferation, and the veins are intensely engorged with red cells.

'The liver weighs 2150 gm. The capsule is smooth but irregular, because of changes in the hepatic structures beneath. The organ is intensely brown. On section, a definite gritty feeling is imparted through the knife. A large amount of dark blood oozes from the cut surface. When this is scraped away, an increase of intense brown fibrous tissue is seen, and the hepatic tissue is markedly diminished and is a very deep brown. This increase in fibrous tissue appears to outline the periphery of the lobules of the liver. The veins are markedly congested and dilated. Grossly, the biliary system and gall bladder are not remarkable.

'Microscopic examination shows that the sections, like those of the pancreas, are mainly brown. There is an intense peripheral fibroblastic proliferation, in which there is evidence of bile duct proliferation. The fibrous tissue

and the bile-duct cells are both loaded with iron-containing pigment which, in the fibrous tissue, is present in free clumps and also in the mononuclear phagocytes. The bile-duct cells show marked degeneration with pyknotic and dropped nuclei as a result of the pigment infiltration. The fibrous tissue contains isolated small groups of parenchymal cells, which are likewise loaded with pigment. The parenchymal cells almost without exception contain varying amounts of pigment infiltration. In some instances there are whole clumps of cells in which nuclei are not demonstrable, or else are pyknotic. The cytoplasm is very coarsely granular and stains irregularly. The sinusoids are widely dilated and filled with closely packed red cells, and the central veins show similar processes. The Kupffer cells in many instances show marked phagocytosis of pigment.

"All the lymph nodes examined, including those of the mediastinum, the upper and lower abdomen and the pelvis, are enlarged and very deep brown. The brown color is universally distributed through their substance. The nodes of the mediastinum are much more markedly swollen than those elsewhere, and are soft and boggy.

"Microscopic examination shows an intense iron-containing pigmentation, the pigment lying free or in the cytoplasm of phagocytes which fill the sinusoids. There is moderate hyperplasia of the lymphoid follicles.

The thyroid is a very deep brown, and on section this color is distributed throughout the gland. The colloid is diminished, and the gland is small and contracted. There is apparently an increase in the fibrous tissue.

"Microscopic examination shows an intense pigmentation of the acinar cells with varying degrees of degeneration, but complete in numerous instances. Entire alveoli are frequently replaced by cell membranes containing large clumps of iron positive pigment. There is a marked proliferation of fibroblasts surrounding the alveoli, and in this fibroblastic tissue there is a very prominent lymphoid infiltration. Large numbers of mononuclear phagocytes filled with pigment are seen. The colloid is greatly reduced in amount.

DISCUSSION

Involvement of the heart muscle in hemochromatosis is by no means uncommon. Bork,¹ in his study of the pathology of the disease, states that in practically all his autopsies there was found considerable pigmentation in the muscle fibers of the heart. Sheldon² states that the heart muscle is pigmented in at least 90 per cent of the cases, the pigment often being present in huge amounts. Blanton and Healy,³ in their review of 22 cases, state that a half showed hemochromatosis within the heart muscle, and that the pigment was generally situated intracellularly at the nuclear poles, fibrosis of the heart muscle was found only once, and was not of marked degree. It is evident from these reports that pigmentary deposits in the cardiac muscle are very frequent but that they seldom lead to marked fibrotic changes.

So far as the case under consideration is concerned, it will be noted that there was very extensive pigmentary deposit and that this was associated with extensive fibrosis of the heart muscle. Furthermore, although the patient had suffered from substernal pain during life, the gross and

microscopic examination of the heart showed almost normal coronary vessels. It would therefore seem logical to assume that the fibrosis in this case was associated with the pigmentary deposit.

It is necessary however to discuss one other possibility: there is a group of cases of hemochromatosis which have been described, particularly by French authorities, in which cardiac failure, probably of a different origin, is a prominent feature. We refer to the syndrome described by Clerc, Bascourret and Andre,⁴ by de Gennès, Delarue and de Vericourt⁵ and by Bezançon, de Gennes, Delarue and Oumansky,⁶ which is characterized by the association of hemochromatosis with infantilism and cardiac failure. This syndrome is described as pigmentary cirrhosis with infantilism, cardiac insufficiency and multiple endocrine aplasia, or as the "endocrinohepatocardiac" syndrome. The essential features of this syndrome are (1) its occurrence at an age which is definitely below the average of most patients with hemochromatosis, (2) an involvement of the endocrine glands, particularly the testes which are atrophic, (3) the occurrence of infantilism as part of the syndrome, and (4) death from cardiac failure. Judging from the description of the French writers the origin of the cardiac failure in these patients is not in the heart muscle itself, because the pathologic changes in the heart muscle are often not particularly pronounced, but is to be explained on an endocrine basis. De Gennes, Delarue and de Vericourt⁵ speak of the condition as a true polyglandular syndrome. They mention the fact already commented on, that although there is evidence of hemochromatosis of the myocardium in most autopsied patients, cardiac insufficiency is rare. They discuss the different types of cardiac failure of endocrine origin, and point out that Waller has described cardiac failure caused by ovarian insufficiency, and that the cardiac insufficiency of thyrotoxicosis and that caused by thyroid insufficiency are well known. They also speak of the role of the adrenals in the production of cardiac insufficiency, the circulatory failure of Addison's disease being a well known example of this condition. They conclude that in this particular group of cases the cardiac failure is of endocrine origin rather than caused by the pigmentary changes in the heart muscle. As a matter of fact, Bezançon and his co-workers⁶ had put forward this same explanation two or three years earlier.

In the case under discussion—a well-developed male of fifty-four—there was no evidence of infantilism, and the autopsy did not indicate any extensive degeneration of the endocrine system except for the pancreas and, to a lesser extent, the thyroid gland. Even in the pancreas fairly normal islands of Langerhans often stood out in the midst

of areas of connective tissue, and while the patient had a high blood sugar, only a trace of sugar was present in the urine and the usual picture of pronounced diabetes was lacking. There was no evidence of testicular atrophy.

CONCLUSIONS

1 The heart muscle is the site of pigmentary infiltration in a large proportion of patients with hemochromatosis.

2 This pigmentary deposit seldom leads to extensive interstitial myocarditis.

3 Occasionally, as in the case reported, interstitial changes occur, and these may be so wide-

spread that they are capable of causing fatal congestive heart failure.

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NEWER DRUGS FOR THE TREATMENT OF TAPEWORM INFESTATIONS

Some Results Obtained With Carbon Tetrachloride, Tetrachlorethylene and Hexylresorcinol

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IN CONSIDERING the essential merits of any anthelmintic, two questions always present themselves: the first concerns its potential toxicity for the host, the second has to do with its efficacy in eliminating the parasite. Other questions also arise, but these are for the most part ancillary.

Among the many medicaments of plant origin which through the centuries have been prescribed for the elimination of tapeworms from man, the drug derived from male fern (*Aspidium* spp.) still enjoys the greatest vogue. The powdered rhizome of the fern, mixed with various other substances, is mentioned by Galen, Pliny and other classical writers. But because treatments often and for unknown reasons fail, efforts to isolate the active principle, filicin, have led to the use, in more recent times, of various extracts of the roots, sometimes in combination with powdered acacia.

As a matter of course, few physicians hesitate to use male fern, for it is the drug most generally recommended in textbooks and treatises on therapeutics. In a recent article, Faust¹ states that "the most reliable drug for all tapeworm infections is probably oleoresin of aspidium." Its potential toxicity, however, must always be kept in mind. The literature is replete with records of severe toxic sequelae, such as headache, vertigo, dyspnea and cyanosis. It often produces gastritis. When absorbed into the system it damages the kidneys and may affect the central nervous system, leading

to various optic disturbances, delirium and stupor. An appreciable number of fatalities following the administration of male fern have also been reported. Contraindications do not appear to be well defined, but some of the conditions in which the drug is to be avoided include pregnancy, in fancy and old age, anemia, and debility due to chronic disease or acute infection.

Treatment with male fern calls for caution and is always time-consuming. To render it effective the patient's diet should be limited to liquids for at least twenty-four hours, and there should be thorough purgation before treatment is instituted. The drug is intensely bitter, and usually produces nausea and vomiting. In order to control toxicity, therefore, as well as to ensure retention of at least part of the medicine, the dose is often given in two or three gelatin capsules at half-hourly intervals. To avoid emesis several recent writers have strongly recommended administration by transduodenal tube, an elaborate procedure, and a discomfiting one for the patient.² That male fern is highly efficacious when it has been freshly extracted, assuring high potency, and when the patient, through attention to diet and to preliminary purgation, has been properly prepared for treatment, is not to be gainsaid (Magath and Brown³). But it is equally true that the results obtained with this drug are exceedingly erratic, even when the patient is hospitalized to secure optimum conditions for treatment.

Another widely used vegetal principle for tape-

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worm treatment is pelletierine, a mixture of alkaloids extracted from the bark of the pomegranate (*Punica granatum*). The relatively insoluble and more stable sulfate of pelletierine with tannin is said to be the least toxic and most efficacious of the several forms in which the drug is available. Nevertheless, it leaves much to be desired. In any of its forms, pelletierine is very disagreeable to take and is liable to produce nausea, vomiting, and in large doses, cerebral symptoms. Again effectiveness is dependent on preparing of the patient by restricting the diet for a day or two and by rigorous purging before and after treatment.

Pelletierine is usually prescribed after failure with male fern. However, as many of the patients seen by us attest, even Tanret's pelletierine, a highly lauded and expensive proprietary product often fails to achieve its purpose. The majority of our patients in Boston give a history of from one to several unsuccessful treatments with either male fern or pelletierine or both, and not a few were discouraged at the prospect of getting rid of their insidious guest. An extreme commentary on the unreliability of standard tapeworm remedies is found in the *British Medical Journal*, where a correspondent⁴ tells of failing repeatedly to depurate a patient, and of finally resorting to operation, at which *the worm was expelled by flushing the intestine with 1 per cent iodine solution*¹.

A proper evaluation of male fern or pelletierine as taeniocides and as drugs liable to produce serious toxic sequelae or fatalities is impossible for lack of statistics, but they obviously do not approach the standards attained by a number of anthelmintics that have been latterly introduced for the treatment of other helminth infestations. Progress in this branch of therapy has now reached the point where, for several species of worms, a choice of highly effective drugs is available and the ideal method of treatment is actually envisaged. This ideal anthelmintic has been defined in terms of absolute safety for the patient and the complete absence of contraindications to its use. It must be easy to administer and not unpleasant to take. Where large masses of people are in need of treatment, the drug should be cheap and easily obtainable in a pure form, and should possess a high order of efficacy. Safety for the patient is naturally a prime requirement of any drug. Where tapeworm infestations are involved, only rarely can the parasite be charged with such pathogenic potentialities as to warrant taking measures for its expulsion which may jeopardize the patient's life.

As might be expected, the perfect taeniocide is still to be discovered. Starting with an unexpected demonstration of the efficacy of carbon tetrachloride in a case of *Taenia solium* infestation, dur-

ing the past eight years we have sought to evaluate this and two other drugs that have less objectionable features than the remedies now commonly employed. Despite unremitting efforts, however, we have been able to outline the course of treatment in only 38 cases. Though this series is too small to warrant final conclusions, our results may be of interest and may serve as a guide to the practitioner.

The number of species of tapeworm that normally may affect man is small, and so far as present information indicates, all these species yield to the same drugs in a nonspecific manner. By far the commonest species of tapeworm involved in our cases from the Boston region was *T. saginata* whose infectious cysticercus stage occurs in beef. *T. solium*, the armed or hooked tapeworm of porcine origin, is veritably nonexistent in this region, and is a rarity in most countries with enlightened systems of meat inspection. Our experience with this species is represented by 3 cases which we treated under primitive field conditions in Yucatan and South Africa. Included in our Boston series also are 5 cases of infestation with *Diphyllobothrium latum*, the broad fish tapeworm which is occasionally encountered among the foreign born members of the community especially those coming from regions bordering on the Baltic Sea.

BIOLOGICAL FACTORS IN RELATION TO PROBLEMS OF TREATMENT

From the zoological viewpoint, a tapeworm represents a self-perpetuating colony of organisms (the segments or proglottids) each of which autonomously performs the functions of food assimilation and sexual reproduction. The head (scolex) with its suckers is the organ with which the entire chain or strobila of segments secures a hold on the wall of the small intestine, usually the lower duodenum. Tapeworms increase in length by budding off new segments. The zone of proliferation is in the neck region, immediately behind the scolex. As the terminal segments mature and become gravid, they spontaneously detach themselves and are passed out singly or in short rows. It is by the passage of segments that infections are usually diagnosed, this being done more often by the patient than by the physician or laboratory worker. For several reasons the microscopic search of the feces for eggs is not a reliable index of infestation. When the parasite is subjected to the influence of irritating drugs and other adverse conditions the longitudinal muscle fibers that hold the segments together may rupture at any point. But unless the scolex is rendered nonviable regeneration will eventually occur. Consequently the expulsion of the scolex furnishes the only immediate

evidence of a final or complete cure. Yet several hours may elapse after treatment before peristalsis delivers the parasite. In this event it often happens that the chain is broken into numerous segments and fragments, variable in size and appearance. The scolex may well be among these isolated scraps, but to find it involves a tedious as well as odious washing of the feces through sieves. In addition, it requires an ability to recognize the scolex that is not often possessed by the non-specialist.

Thus, failure to identify the scolex does not necessarily mean that it has not been expelled or that treatment should be repeated. In any event, the patient should be spared a second treatment until some time has elapsed, for the toxic effect of most anthelmintics is cumulative. In cases where the scolex has not been recovered, the passage of sufficient time for regeneration of the strobila becomes the critical test of cure. Therefore, in order to assess the efficacy of the drug it is necessary to keep a check on the patient for a considerable period, during which he must observe every precaution against reinfection.

The potential longevity or natural life span of these parasites is reliably known to be not less than from twenty to thirty-five years. Hence natural death of the parasite and spontaneous cure of the patient are hardly likely to occur within the ordinary period of observation. The essential question is, How long must be the period of absence of signs of infestation before the test treatment can be accounted successful? In the majority of unsuccessful treatments with male fern, segments reappear in the stools within six weeks. Insofar as experimental studies have shown that the species of tapeworms here considered come to maturity and release segments within sixty to seventy-five days after the infectious larval stages have been ingested, from ninety to one hundred days has been regarded as a conservative period of probation by the few investigators who have considered this factor in evaluating results.⁵ As our results have shown, this period of freedom from passing segments does not afford a reliable index of the taeniocidal value of all drugs, for we have had several cases treated with hexylresorcinol who claim to have been free from segments for as long as eight months before recidivism became manifest. In these cases the possibility of a renewal of the infestation cannot, of course, be entirely excluded, but it seems highly improbable, for even were larval infestation of beef less rare than it is, our patients have been so worried by their infestations that they have needed no urging in order to adopt the strictest dietary precautions.

CARBON TETRACHLORIDE

Before presenting our own observations, it will be well to review briefly the history of carbon tetrachloride as an anthelmintic, pointing out some of the virtues of the drug as well as its shortcomings.

Before the inauguration of a formal project for the standardization and development of new anthelmintics by the Bureau of Animal Industry of the United States Department of Agriculture, the attitude toward anthelmintic medication was one of uncritical empiricism. As a result of a series of critical experiments in 1921, Hall⁶ discovered that carbon tetrachloride (CCl_4) was an excellent remedy for canine ancylostomiasis, and recommended the trial of the drug as an anthelmintic for man. This suggestion was almost immediately acted upon, but before the drug became widely adopted as a specific against hookworm, exhaustive tests were carried out on many subjects, including criminals who were about to be executed.⁷ At first, carbon tetrachloride appeared to be completely lacking in toxicity. Within a few years of its introduction it had been administered to millions of people in tropical and subtropical countries, where, on the score of its general safety and relative cheapness, it has become the drug of choice for the treatment of ancylostomiasis. Used with ordinary discretion it gives admirable results, as indicated by Lambert,⁸ who has reported 100,000 treatments for hookworm among the natives of the South Pacific islands, without a single death and with few untoward sequelae. In Egypt, where 5 cc. is the routine dose for adults, Tomb and Helmy⁹ have recently reviewed the question of the toxicity of carbon tetrachloride on the basis of the treatment of 1,600,000 patients. Nineteen fatalities were recorded, but the majority of these, it is claimed, could have been prevented. The occurrence of occasional fatalities has led to a comprehensive investigation of the pharmacology of this compound.¹⁰

Because of its remarkable record of safety in an enormous number of cases, carbon tetrachloride must be recognized as one of the most valuable drugs in the entire pharmacopoeia. Yet any notion that it is innocuous has been dispelled. To some extent it is always absorbed into the system, and damage, particularly to the liver parenchyma, consistently follows, even though the patient may show no clinically recognizable symptoms. To reduce absorption from the intestine, an effective saline purge (preferably sodium sulfate) should be administered either with the anthelmintic or within an hour after taking it. All liquids containing alcohol, and all foods rich in fats, both of which tend to enhance absorption, should be enjoined.

for at least a day before and after treatment. It is imperative that there be prompt purgation within a few hours, and in cases of stubborn constipation, enemas or other methods of procuring elimination must be used.

In this connection a note of warning is necessary, the opinion having been expressed that some of the deaths following carbon tetrachloride have been due to too vigorous purgation with saturated magnesium sulfate solution rather than to the poisonous action of the drug. Chronic or acute cirrhosis, whether due to alcoholism or to other causes, and kidney disease are mentioned as the outstanding contraindications to the exhibition of carbon tetrachloride; the drug should be combined with oil of chenopodium in cases where round worms (*Ascaris lumbricoides*) are also harbored. To minimize the effect on the liver, it is advised that the blood-calcium reserve be built up and that carbohydrates in the diet, particularly sugar, be increased for some days before treatment. A certain amount of nausea, dizziness or headache is to be expected, but the patient should not be alarmed, for these symptoms usually disappear as soon as the bowels move.

In some cases, deaths following the administration of carbon tetrachloride have been ascribed to an idiosyncrasy. Furthermore, toxicity does not appear to bear a direct relation to the dosage. On occasion, but apparently unintentionally, as much as 50 cc.—which is almost ten times the usual dose—has been administered without evoking serious symptoms of intoxication.¹¹ On the other hand, deaths have been recorded following the taking of as little as 1.5 cc. It is well to remember, however, that in extended series of treatments given under field conditions, where physical examination is necessarily omitted, the death rate is probably no higher than 1 per 100,000. Most of our patients were well-nourished adults, but we have never found it necessary to give more than 4 cc. In the case of an aged and rather debilitated woman, 3 cc. was given, and in the case of a boy of twelve caution suggested that only 2 cc. be administered.* The drug, given either in water or with a little milk, has always been well tolerated, although there is usually some dizziness and drowsiness during the first hour. As our results bear witness, for effective treatment against tapeworm it is not at all necessary that the patient be starved before treatment or that there be a preliminary purgation, but on general principles patients have been advised to restrict their supper to toast and milk, and to have an enema on the evening before taking treatment. The drug is given the first thing in the morning, the patient refraining

from eating until good purgation has occurred. The tapeworm is usually expelled within two or three hours after treatment, and thereafter the patient may resume normal activity.

Deriving their opinion by analogy from the results of therapeutic tests with tapeworm-infested dogs, Hall and Shillinger¹² at first declared that carbon tetrachloride was probably of little value against tapeworms in man or in other animals, Chandler and Mukerji,¹³ working in India, concurred. It is interesting to observe that these early opinions, based as they must have been upon personal impression rather than upon tests, were completely reversed within a few years.

Attention was first called to the value of carbon tetrachloride as a specific against the tapeworms of man by Daubney and Carman,¹⁴ who while treating hookworm patients in East Africa in 1928 noticed that after the administration of a mixture of carbon tetrachloride and oil of chenopodium tapeworms were often passed. The incidence of *T. saginata* among these raw meat-eating natives is extremely high, and provides ample opportunity for testing taeniocidal drugs. On testing the effect of 4 cc. of carbon tetrachloride on 30 patients, Daubney and Carman found that after a lapse of seven weeks only 1 patient was still passing tapeworm segments, a therapeutic efficiency of 97 per cent. Two interesting and rather significant observations derived from further tests were these: (1) the efficacy of the drug appeared to be reduced rather than enhanced by subjecting the patient to preliminary catharsis, (2) the tapeworm was usually dead on expulsion and had undergone fragmentation, so that the scolex was rarely found attached.

Other investigators have shown that a detached scolex undergoes rapid degeneration, so that it can scarcely be recognized when found in the feces. Continuing studies on the treatment of tapeworm infestations in Kenya Colony, Carman¹⁵ recorded comparably favorable results in from 2500 to 3000 natives who were given a mixture of 4 cc. carbon tetrachloride and 1 cc. oil of chenopodium.* The treatments were given on an outpatient basis at field posts, without a single instance of untoward symptoms. Similarly enthusiastic reports on the efficacy of carbon tetrachloride as a convenient and effective drug for the removal of *T. saginata* have recently appeared in the literature of many countries, for example, Kemp,¹⁶ Hoffman¹⁷ and Talice.¹⁸

The first 4 patients in the series presented in Table 1 applied for treatment in the field while

*Although it has long been known that oil of chenopodium is by itself often capable of expelling tapeworms, the investigations of Napleton and Mukerji¹³ have shown that the carbon tetrachloride in the mixture here mentioned is the more effective of the two.

For young children, Lambert¹⁹ prescribes 0.2 cc. for each year of age.

we were on expeditions in Yucatan and Rhodesia, where, without facilities for accommodating the patient, it was impractical to continue observation for more than two hours. Within this period, in 2 of these 4 cases we were able to confirm the expulsion of the worms with scolices attached, in the other 2, final assessment of efficacy could not be made. The remaining 12 cases, including 2 cases of *D. latum* infestation, were treated in or near Boston, either in hospitals or in the patient's home under the care of the family physician. In Case 33

Table 1 *Results of Treatment with Carbon Tetrachloride*

CASE NO	SPECIES	DOSE	RESULTS OF FOLLOW UP	
		cc		
1	<i>T. solium</i>	4	Worm passed up to neck	No follow up
2	<i>T. solium</i> and <i>T. saginata</i>	4	Three worms passed two with scolex	
3	<i>T. saginata</i>	4	Worm passed with scolex	
4	<i>T. saginata</i>	3	Worm passed in fragments	No follow up
5	<i>D. latum</i>	4	Scolex passed	
6	<i>T. saginata</i>	4	Worm passed up to neck	No later report from patient
7	<i>T. saginata</i>	4	Worm passed in fragments	Patient free from segments after 28 months
11	<i>T. saginata</i>	4	Two worms passed with scolex	
16	<i>T. saginata</i>	4	Treatment at home.	Patient free from segments after 18 months
27	<i>T. saginata</i>	4	Worm passed with scolex.	
28	<i>D. latum</i>	4	Worm in fragments (with scolex?)	Patient free from segments after 10 months
30	<i>T. saginata</i>	4	Worm passed with scolex	
33	<i>T. saginata</i>	4	Drug vomited on two occasions	No cure
34	<i>T. saginata</i>	2	Worm passed with scolex	
36	<i>T. saginata</i>	4	Worm passed with scolex	
38	<i>T. saginata</i>	4	Worm passed in fragments	Patient free from segments after 10 months

the hospital intern reported that the patient could not tolerate the drug and vomited each time it was given. Although several feet of the worm chain were passed, this case is reckoned as a failure, but it might justifiably have been excluded from the series. Of the remaining 11 cases, reports subsequent to treatment were secured in all but 1 (Case 6), and although search for the scolex was futile in several cases, the statements of the patients indicated that treatment was completely satisfactory. These results are very much in keeping with the favorable reports to which reference has already been made.

TETRACHLORETHYLENE

Like carbon tetrachloride, tetrachlorethylene (C_2Cl_4) was also introduced into medicine via the veterinary field. Before its trial in human beings was suggested, Hall and Shillinger²⁰ had found the drug to be almost as efficacious against hookworm in the dog as was carbon tetrachloride, over which it appeared to have two advantages: it had a less unpleasant taste, and, being less soluble in water, it was less readily absorbed through the intestine, so that it produced no detectable pathologic or functional damage to the liver, even when administered together with alcohol to increase

absorption in test animals. Tetrachlorethylene has been given in innumerable cases (probably several hundred thousand) of hookworm infestation without any fatalities, or cases, of serious intoxication being reported. In the literature it is mentioned that occasionally there is vomiting, and slight vertigo of an anesthetic rather than a toxic nature. Although tetrachlorethylene lacks the toxicity of carbon tetrachloride, it is not used on such a massive scale as the latter. This is possibly because of its slightly greater cost, and possibly because of a general conviction that in actual practice the dangers of carbon tetrachloride are negligible.

Because of the reputed superiority from the pharmacologic standpoint of tetrachlorethylene over carbon tetrachloride, we attempted to determine its taeniocidal value. The experience of Hall and Shillinger²⁰ indicated that the drug was of no value against tapeworm in dogs, but it does not appear to have been adequately tested for these infestations in man. In the literature, the only reference that we have found is the brief and incidental mention of Maplestone and Mukerji¹⁹ that they tried tetrachlorethylene (dosage not stated) on three patients with no apparent effect on the tapeworm.

Unfortunately, the number of cases in our series is too small to warrant final conclusions as to the value of tetrachlorethylene against *T. saginata*. Altogether it was tried in 8 cases, the dosage being generally 4 cc and the method of treatment being similar to that with carbon tetrachloride. On each occasion a large portion of the strobila extending up to the attenuated neck region was expelled, but the scolex was never found attached. In 3 cases we received no report from the patient after his discharge from the hospital. In 1 case, segments reappeared twelve days after treatment, while in another they did not reappear until nearly three months had elapsed. The fifth case concerned a patient who was admitted to the hospital with severe jaundice and fever of undiagnosed origin. The only positive laboratory finding was a tapeworm infestation, which the physician considered might have involved the bile duct and caused obstruction. In view of the patient's condition tetrachlorethylene appeared to be the drug of choice, and 3 cc was administered instead of the usual 4 cc. A mass of tapeworm segments was passed in due course, but the scolex was not found. After an exploratory operation a month later, the patient died. At autopsy a large liver abscess, possibly amebic, was found, but the pathologist reported no trace of a tapeworm in the intestine. The conditions presented in this case may be regarded as an ideal set-up for the crucial test of a drug's efficacy. In the 2 remaining cases of this series, according to reports received about six months after

treatment, there was no recurrence of infestation. There consequently appear to have been cures in 3 of the 8 cases treated with tetrachlorethylene.

HEXYLRESORCINOL

Hexylresorcinol was introduced by Leonard¹ in 1924 for the treatment of genito-urinary infections. In preliminary tests, it was taken by Leonard and several volunteers in 1 gm doses, four times a day for two consecutive weeks, without any toxic manifestations. In 1930, Lamson, Ward and Brown² first drew attention to hexylresorcinol as an anthelmintic that was especially effective against *A. lumbricoides* and other nematode parasites in the intestine, and that indeed closely approached the ideal anthelmintic. The drug has been very widely used as a urinary antiseptic, and has been given as an anthelmintic to thousands of persons without serious sequelae.

Hexylresorcinol is soluble in alcohol, glycerin and vegetable oils, but only slightly in water. Because of its affinity for proteins, solutions in olive oil, for example Caprocol, are likely to be inert. For this reason hexylresorcinol is best given as an anthelmintic in the form of sugar-coated pills, on an empty stomach. Lamson et al.²² prescribed doses ranging from 0.15 gm for young children to 10 gm for adults.

Our tests of hexylresorcinol as a taeniocide were initiated early in 1931. In the following year, Lamson and Ward²³ mentioned having rid dogs of tapeworms with this substance and having tried it in several patients who expelled yards of worms without the scolex. More recently, Maplestone and Mukerji²⁴ in Calcutta reported treating 10 cases of *T. saginata* with 1 gm doses of this drug in hard gelatin capsules. Reports from 9 of the 10 patients three months after treatment showed the return of segments in the stools of 4. The authors discontinued their trials of hexylresorcinol on the ground that carbon tetrachloride was cheaper and yielded better results.

In our series of 24 cases, initial tests with hexylresorcinol were made with 1 gm doses of sugar-coated pills†. The following simple procedure was usually adopted. After a light evening meal the intestinal tract was cleared as much as possible without incommoding the patient. The pills were administered on arising next morning, with an unlimited amount of water to reduce or prevent the slight burning sensation in the epigastric region that is sometimes the subject of complaint*. A few of our female patients vomited,—largely

it appears, because of the revival of unpleasant memories associated with previous experiences with male fern,—but the distress appears never to have been severe. A mineral oil or saline purge was given about an hour after the drug and food was withheld for another few hours. Often the parasite was expelled much shriveled and evidently dead. However, since fragments of the chain may continue to pass for at least forty-eight hours we usually dispense with a search for the scolex in the feces. When some of the patients reported remission of segments, we decided to give subsequent treatments with larger doses to all except debilitated subjects. The safety of much larger doses had already been indicated by Leonard's²¹ experiments, and we ourselves did

Table 2 Results of Treatment with Hexylresorcinol

CASE NO.	SPECIES	DOSE gm	RESULTS & FOLLOW UP
9	<i>T. saginata</i>	10	Free from segments after 14 mo
10	<i>T. saginata</i>	10	Free from segments after 13 mo
11	<i>T. saginata</i>	10 30	Reappearance of segments after 4 mo Reappearance of segments after 3 mo
12	<i>T. saginata</i>	10	Free from segments after 11 mo
13	<i>D. latum</i>	10	Free from segments after 5 mo
14	<i>D. latum</i>	0.8 20	Reappearance of segments after 4 mo Free from segments after 14 mo
15	<i>T. saginata</i>	10	Reappearance of segments after 1 mo
16	<i>T. saginata</i>	10 30	Reappearance of segments after 3 mo Reappearance of segments after 7½ mo
18	<i>T. saginata</i>	20	Reappearance of segments after 5 mo
19	<i>D. latum</i>	30	Examination after 1 mo negative No further report
20	<i>T. saginata</i>	12	No report from patient
21	<i>T. saginata</i>	30	No report from patient
22	<i>T. saginata</i>	30	Scolex passed (?) Freedom from segments after 3 mo
23	<i>T. saginata</i>	2.6 2.6	Reappearance of segments after 4 mo Reappearance of segments after 2¼ mo
24	<i>T. saginata</i>	1.2	Reappearance of segments after 4½ mo
30	<i>T. saginata</i>	30	Reappearance of segments after 1 mo
31	<i>D. latum</i>	44†	Free from segments after 43 mo
32	<i>T. saginata</i>	60†	Free from segments after 12 mo
33	<i>T. saginata</i>	20	Reappearance of segments after 2½ mo
34	<i>T. saginata</i>	1.2	Reappearance of segments after 3½ mo
36	<i>T. saginata</i>	30	Reappearance of segments after 2 mo
37	<i>T. saginata</i>	24	Free from segments after 5 mo
38	<i>T. saginata</i>	30	Reappearance of segments after 2 mo
39	<i>T. saginata</i>	30	No report from patient

*Second treatment.

†Given in two equal doses on successive days.

not observe any untoward effect after administering three 1-gm doses of hexylresorcinol at approximately hourly intervals on two consecutive mornings.

As shown in Table 2, hexylresorcinol is to be credited with success in at least 7 out of 24 trials. The medication may be effective in doses as low as 1 gm. On the other hand, a dose of 3 gm given at hourly intervals may fail. Whether or not the method of administration is the factor responsible for the lack of consistency in the results is a question requiring further investigation.

The observation that after exposure to an anthelmintic a tapeworm may not evince signs of its con-

*Supplied through the courtesy of the manufacturers Sharp and Dohme, Philadelphia.

Hexylresorcinol has the qualities of a local irritant, producing a burning sensation with superficial necrosis on the tongue and on the gastric mucosa. Hence children are cautioned against chewing the sugar-coated pills. The irritant effects are usually mild and transient; the damage to the mucosa is rapidly repaired and is clinically negligible.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24071

PRESENTATION OF CASE

First Admission A thirty-three-year-old, white Canadian housewife entered the hospital with the complaint of abdominal pain of eight days' duration

Eight days before entry she noticed the onset of mild, crampy, low back pain, which during the day became gradually more severe and radiated to both lower quadrants, particularly the right. The patient said the pains resembled labor pains. She had complete anorexia with frequent nausea and would have gone to bed if she had not had to take care of four small children. She also became somewhat constipated, and during the two days before entry her bowels did not move. On the second day of her illness the pain became localized in the right lower quadrant, but two days later it became much more severe and generalized, persisting thus up to the time of entry. She had severe nausea and vomited once on the morning of entry. She had had no previous attacks, but for several months she had been subject to "bilious spells" with headache, nausea and vomiting which lasted one or two days and occurred about every two weeks. For some months she had felt tired and physically below par. She had had no fever or other symptoms except one brief shaking chill on the morning of entry.

Her menstrual periods had always been regular up to one year before entry, when they became prolonged, lasting ten or twelve days, with excessive bleeding and clots. Two months before entry the interval between periods became suddenly shortened to eighteen days, and the menorrhagia persisted. Her last period ended nine days before entry, but two days later she flowed again for a single day.

She was born in Nova Scotia and for the four years before entry had lived in a town near Boston. She had never been anywhere outside of the north eastern part of North America. However, her husband, in the course of his business, periodically received shipments of snails from South Africa which both she and he handled and sorted for distribution to museums and other institutions in this country. Her past history and family history were noncontributory.

Physical examination revealed a well-developed

and nourished, pale, listless female, appearing acutely ill. The heart and lungs were negative, and the blood pressure was 126 systolic, 80 diastolic. There was moderate distention of the lower part of the abdomen, and peristalsis was much diminished. The entire abdomen was tender throughout, with exquisite tenderness and spasm in the right lower quadrant. A very tender grapefruit-sized mass could be palpated in that area, and there was marked rebound tenderness. On pelvic examination a large tender mass could be palpated in the right vault, and the left vault was diffusely tender.

The temperature was 103.6°F by rectum, the pulse 132. The respirations were 24.

The urine examination was negative. The blood showed a red-cell count of 4,000,000 with 60 per cent hemoglobin, and a white-cell count of 26,500. The corrected sedimentation rate of the red cells was 0.1 mm per minute. The nonprotein nitrogen of the blood serum was 19 mg per cent, the protein 4.9 gm per cent, and the chlorides equivalent to 99 cc of N/10 sodium chloride. On the fourth day an operation was performed. An oblique incision was made over the tender mass centered at the right border of the rectus muscle. When the peritoneum was incised, matted coils of intestine presented. The fibrinous adhesions were easily separated, and a large well-walled-off abscess was found, which apparently lay medial to the cecum. It was aspirated, and drainage wicks were placed into it before closing the wound.

Bacteriological examination of the fluid failed to show any organisms. Two days after the operation her temperature had fallen to normal, and her white-cell count gradually fell to 7700. Over a period of three weeks the wound continued to drain pus which slowly lessened in amount. A culture of the pus on the eleventh postoperative day showed *Staphylococcus aureus*. She was discharged on the twenty-eighth day, at which time no masses could be made out in the abdomen. However, pelvic examination showed definite thickening and induration in the right vault.

Final Admission (five weeks later) After discharge she went to a convalescent home where she stayed up to the time of re-entry. The wound continued to drain moderate amounts of semi-fluid, green, non-odorous material without any blood or feces. She had a slight dull ache in the region of the sinus, but no severe pain. Her appetite was good and she gained 13 lb in weight. Her bowel movements were normal.

Physical examination showed the right lower-quadrant scar with a draining sinus. There was some tenderness and spasm in the surrounding area, and pelvic examination showed induration and tenderness in the right vault.

give pain in the left side as well as the right, but there again, if a Meckel's diverticulum were inflamed and formed an abscess, one would expect to find *Bacillus coli* in the original drainage of the abscess and, again, that the sinus tract would heal or form a fecal fistula. It is possible that perforation of the intestine into the mesenteric border by foreign body, such as a porcupine quill or needle, might have caused a sterile abscess in the mesentery which could give such a picture as this, and if the foreign body did not come out in five weeks, I suppose it is possible that it might keep the tract open. But there is no history suggesting such a possibility, and we have to let it go at that.

When she came in she had this grapefruit sized mass in the right vault and tenderness in the left vault, and she might have had salpingitis. If she had gonorrheal salpingitis one would expect symptoms of dysuria, frequency and vaginal discharge when the disease was contracted. These are completely lacking, but in a female they might have been mild and overlooked. One would not expect gonococci on culture at the time of drainage. She might have had a hydrosalpinx which, four or five weeks after contracting the disease, would have been sterile on culture. Again, I should expect the sinus to heal unless there was a secondary infection or a tuberculous salpingitis. Although this thing had been going on for some months she was well-developed and nourished, not emaciated. With a tuberculous pelvic infection that goes on to secondary abscess formation, one would expect examination of the pelvis to show induration. It does not seem to be the picture of tuberculous salpingitis. However, this would explain the chronicity of the sinus tract.

Possibly she had a twisted ovarian cyst or even a pedunculated fibroid that was twisted. Either of these might have become gangrenous. In considering the possibility of perforation of the intestine, I should have mentioned that one would expect sudden prostration. In the same way, in a twisted pedunculated fibroid becoming gangrenous one would expect a sudden prostrating form of trouble. It was eight days, however, after symptoms started before she came to the hospital. Again, it says that the mass was a walled-off abscess, and it seems unlikely that the surgeon would not have seen that it was something queer or suggestive of gangrenous cyst or abscess from gangrene.

I think that the menstrual irregularity that she had does not necessarily mean that the primary trouble was in the ovaries or tubes. Any sort of inflammatory reaction in the lower abdomen or pelvis—and we know she had it—could easily involve the ovary and tube with adhesions, and so

forth, sufficient to give her irregularity. I do not believe that it is significant enough to point to the trouble as arising primarily in the pelvis.

How about syphilis? It might have been a broken-down gumma of the mesenteric nodes, but that is all I can say. There is no report of a Hinton test, and no history of contact. I think it is unlikely.

We must next consider unusual infections or infestations. This patient had been living in America, this rules out many of the tropical diseases. *Entameba histolytica* infection is unlikely, because that also comes in the category of perforation of the intestine. Actinomycosis might be the reason for keeping the sinus tract chronic. Actinomycosis of the intestines is not unknown without any other lesions. There is no history, however, of contamination from contact with straw and hay. We have to assume that granules might have been looked for in the smear which was said to be negative, but this does not necessarily rule out actinomycosis. The thing that does rule it out is that she was not emaciated and on the second entry had gained 13 lb. Furthermore, drainage of an actinomycotic abscess would not be adequate treatment, the disease would spread, with more sinus tracts and fistulas five weeks later. I believe she was not sick enough to have had it.

Then comes the question of the snails. Snails do serve as hosts for several parasitic organisms. Would it be fair to ask for a differential count?

DR TRACY B. MALLORY: On two smears the polymorphonuclears were 63 and 82 per cent respectively. No eosinophils were seen on either occasion. The lymphocytes were 16 and 12 per cent and the monocytes 4 and 16, respectively.

DR. STURGIS: I am sorry about that because I should like to have found a high eosinophilia. Apparently none were seen. In considering parasites in South Africa, the flukes or flat worms, schistosomes, are prevalent. I believe that there are no cases reported in America that cannot be traced to direct or indirect contact with the parts of the world where the parasite is prevalent. The schistosome parasite has an encysted state in snails, and human beings can be infected through the skin as well as by the oral route. The parasites may lodge in the pelvic veins where they develop to the adult stage. They have a tendency to locate in the rectum, ovary, bladder and sometimes in the appendix. It seems that a perfectly good case could be worked out for infestation with *Schistosomum hematobium*, the blood fluke, coming in snails in the encysted form, working through the skin, and lodging in the appendix, to give an appendiceal abscess. At the same time I suppose if that were the case she might have a generalized schistosomiasis in the pelvic veins and

give pain in the left side as well as the right, but there again, if a Meckel's diverticulum were inflamed and formed an abscess, one would expect to find *Bacillus coli* in the original drainage of the abscess and, again, that the sinus tract would heal or form a fecal fistula. It is possible that perforation of the intestine into the mesenteric border by foreign body, such as a porcupine quill or needle, might have caused a sterile abscess in the mesentery which could give such a picture as this, and if the foreign body did not come out in five weeks, I suppose it is possible that it might keep the tract open. But there is no history suggesting such possibility, and we have to let it go at that.

When she came in she had this grapefruit sized mass in the right vault and tenderness in the left vault, and she might have had salpingitis. If she had gonorrheal salpingitis one would expect symptoms of dysuria, frequency and vaginal discharge when the disease was contracted. These are completely lacking, but in a female they might have been mild and overlooked. One would not expect gonococci on culture at the time of drainage. She might have had a hydrosalpinx which, four or five weeks after contracting the disease, would have been sterile on culture. Again, I should expect the sinus to heal unless there was a secondary infection or a tuberculous salpingitis. Although this thing had been going on for some months she was well-developed and nourished, not emaciated. With a tuberculous pelvic infection that goes on to secondary abscess formation, one would expect examination of the pelvis to show induration. It does not seem to be the picture of tuberculous salpingitis. However, this would explain the chronicity of the sinus tract.

Possibly she had a twisted ovarian cyst or even a pedunculated fibroid that was twisted. Either of these might have become gangrenous. In considering the possibility of perforation of the intestine, I should have mentioned that one would expect sudden prostration. In the same way, in a twisted pedunculated fibroid becoming gangrenous one would expect a sudden prostrating form of trouble. It was eight days, however, after symptoms started before she came to the hospital. Again, it says that the mass was a walled-off abscess, and it seems unlikely that the surgeon would not have seen that it was something queer or suggestive of gangrenous cyst or abscess from gangrene.

I think that the menstrual irregularity that she had does not necessarily mean that the primary trouble was in the ovaries or tubes. Any sort of inflammatory reaction in the lower abdomen or pelvis—and we know she had it—could easily involve the ovary and tube with adhesions, and so

forth, sufficient to give her irregularity. I do not believe that it is significant enough to point to the trouble as arising primarily in the pelvis.

How about syphilis? It might have been a broken-down gumma of the mesenteric nodes, but that is all I can say. There is no report of a Hinton test, and no history of contact. I think it is unlikely.

We must next consider unusual infections or infestations. This patient had been living in America, this rules out many of the tropical diseases. *Entameba histolytica* infection is unlikely, because that also comes in the category of perforation of the intestine. Actinomycosis might be the reason for keeping the sinus tract chronic. Actinomycosis of the intestines is not unknown without any other lesions. There is no history, however, of contamination from contact with straw and hay. We have to assume that granules might have been looked for in the smear which was said to be negative, but this does not necessarily rule out actinomycosis. The thing that does rule it out is that she was not emaciated and on the second entry had gained 13 lb. Furthermore, drainage of an actinomycotic abscess would not be adequate treatment, the disease would spread, with more sinus tracts and fistulas five weeks later. I believe she was not sick enough to have had it.

Then comes the question of the snails. Snails do serve as hosts for several parasitic organisms. Would it be fair to ask for a differential count?

DR TRACY B. MALLORY. On two smears the polymorphonuclears were 63 and 82 per cent respectively. No eosinophils were seen on either occasion. The lymphocytes were 16 and 12 per cent and the monocytes 4 and 16, respectively.

DR. STURGIS. I am sorry about that because I should like to have found a high eosinophilia. Apparently none were seen. In considering parasites in South Africa, the flukes or flat worms, schistosomes, are prevalent. I believe that there are no cases reported in America that cannot be traced to direct or indirect contact with the parts of the world where the parasite is prevalent. The schistosome parasite has an encysted state in snails, and human beings can be infected through the skin as well as by the oral route. The parasites may lodge in the pelvic veins where they develop to the adult stage. They have a tendency to locate in the rectum, ovary, bladder and sometimes in the appendix. It seems that a perfectly good case could be worked out for infestation with *Schistosomum hematobium*, the blood fluke, coming in snails in the encysted form, working through the skin, and lodging in the appendix, to give an appendiceal abscess. At the same time I suppose if that were the case she might have a generalized schistosomiasis in the pelvic veins and

the time of the first operation no effort was made to find the appendix. At the second operation we explored the peritoneal cavity, still laboring under the mistaken idea that we had drained an appendiceal abscess. When she came in the second time as Dr Sturgis logically pointed out, the sinus should have discharged fecal material or it should have closed had the original trouble been caused by her appendix. I made a paramedian incision and under the McBurney incision found the sinus tract matted with coils of intestine. These I freed and found that the sinus tract continued down to a point over the great vessels in the pelvis. There the sinus tract apparently entered into a lymph node in that region. There was a mass involving the right tube and ovary. The left tube was not strikingly abnormal save for small nodules along it. Similar nodules were more easily seen on the right side, where the mass was present. The uterus was tied down, chiefly posteriorly, by adhesions that could be separated fairly readily and seemed of long standing rather than of short duration. When I saw the appearance of the pelvis the impression I gathered was that it was probably pelvic inflammatory disease. We asked one of the pathologists to come over, and I excised one of the small nodules that appeared on the tube and gave it to him to section. It was about 0.75 cm in diameter, and on section it was seen to have a well-formed wall with a caseous center. He was completely satisfied that it represented tuberculosis. At the end of the first operation the diagnosis was acute appendiceal abscess. At the second operation the diagnosis was tuberculous salpingitis, after about a week of making myself a nuisance to Dr Mallory we got as far as schistosoma salpingitis, and after a much longer period than Dr Sturgis took, we arrived at the correct diagnosis.

DR. MALLORY: This gross appearance of the tubes is apparently very characteristic of the condition which has been reported several times in the American and German literature as pseudo-tuberculosis, apparently due to pinworms.

DR. JOE V. MEIGS: You find pinworms in appendices. Do they ever perforate?

DR. MALLORY: A significant percentage perhaps 1 or 2 per cent, of appendices contain pinworms, perhaps more than that in children. In all the literature on the subject there are only one or two papers suggesting that they penetrate its wall, and those are under a cloud of doubt. On the other hand this invasion of the peritoneal cavity via the female genital tract is perfectly well established.

DR. Faxon: I might say that the appendix was retrocecal and now here near the mass in the pelvis.

It was perfectly free and grossly normal, on section no lesion was found.

DR. FRANCIS T. HUNTER: In the literature is eosinophilia mentioned?

DR. MALLORY: It usually is found in the local reaction around the ova, but not mentioned in the blood.

A PHYSICIAN: Did you find the worms?

DR. MALLORY: We made the correct diagnosis long after the patient had gone home. She was not examined for pinworms.

A PHYSICIAN: Were any whole worms found in the specimen?

DR. MALLORY: No, just the ova, the worms had been destroyed by inflammatory reaction whereas the ova were more resistant and remained behind to produce a foreign-body reaction that closely resembled tuberculosis.

CASE 24072

PRESENTATION OF CASE

A forty-eight-year-old, white, American housewife entered the hospital with the complaint of severe abdominal pain of thirty-six hours' duration.

She was well and healthy until about six weeks before entry, when she had "intestinal gripe" of three or four days' duration. Epigastric pain was the only symptom she remembered at that time. Thirty-six hours before entry, she was suddenly awakened in the morning by a sharp, gripping, midepigastric pain which made her cry out. She got out of bed, defecated a small amount, and vomited some normal-appearing gastric contents. Her physician was called and gave her a hypodermic injection which eased but did not abolish the pain. During the course of the day and evening the pain shifted to the lower abdomen and became cramplike in character. She was given another hypodermic and took "small white pills" every hour. The following morning the pain was somewhat less severe and still localized in the lower part of the abdomen. She had no further vomiting but felt quite nauseated, had anorexia, and raised considerable amounts of gas. Since the defecation at the time of the onset of the pain, she had passed neither gas nor feces by rectum. About eight hours before entry she was given an enema with little result. She had had no cardiorespiratory or genitourinary symptoms, and her menstrual history was negative. Her past history and family history were noncontributory.

Physical examination revealed a well-developed but somewhat emaciated woman sitting upright in bed, breathing rapidly, in obvious discomfort. The skin was dry and flushed, and the tongue

pelvic peritoneum, which would explain the things that puzzled me before—the large abscess medial to the cecum and her generalized abdominal tenderness and spasm. The discharge of eggs through the sinus would also explain its chronicity. Perhaps the snail was put in to make it harder, but I will stand by my diagnosis.

PREOPERATIVE DIAGNOSIS

Residual appendiceal abscess

DR STURGIS'S DIAGNOSES

Schistosoma infection of appendix with abscess formation

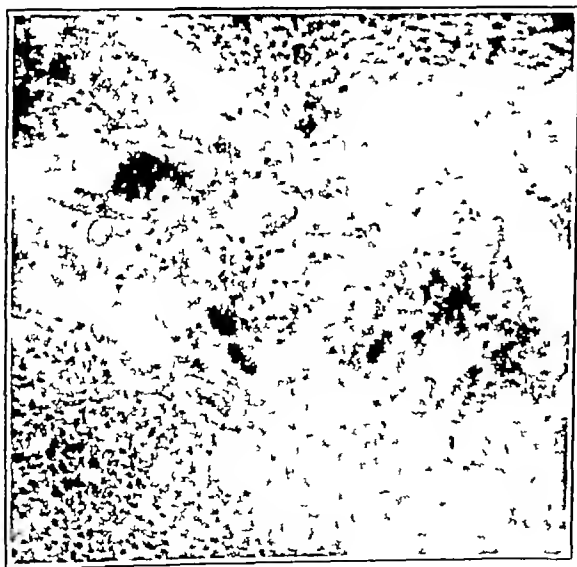
Generalized schistosomiasis of pelvic peritoneum

ANATOMICAL DIAGNOSIS

Oxyuris infection of the salpinx and pelvic peritoneum

PATHOLOGICAL DISCUSSION

DR MALLORY: We have been made very conscious of schistosoma by the recent visit of two South Africans here, and that question came up very definitely in this case after we had examined the tube and found in its walls a lot of peculiar looking ova. However, when we sent the material to some of the experts in the Department of Comparative Pathology at the Harvard Medical School they failed to confirm our suspicions. The accompanying photomicrograph shows a typical



microscopic field. In the upper left-hand corner is a huge giant cell. Below its right-hand end are four or five lozenge-shaped masses with dark central areas and clear hyaline capsules around them. Five or six of these ova are twice as big as the others. True schistosoma have spines, which

are easily made out. Whether they are at the end or on the side distinguishes the different species. When the ova in this case were compared with schistosoma it was evident that they were too small, and, moreover, we were unable to find any spines, which are so characteristic of schistosoma. However, sometimes in a section it is difficult to make out the spine because the ova may have been cut at the wrong angle. The ova which most closely correspond in appearance to these are those of the ordinary pinworm, *Oxyuris vermicularis*. With a little research on the part of the laboratory staff we have found a number of papers* reporting about 20 cases of pinworm infestation of the tubes or the peritoneal cavity. Peritoneal infestation has never been reported in males. In many of these cases it has been possible to find the pinworms in the vagina, uterus or tubes, evidently on the way up the genital tract. So I think there is no question that in this case the worms must have climbed up through the vagina and uterus. Whether the inflammatory reaction that develops in these cases is due entirely to the pinworm or whether there is a secondary bacterial inflammation has never been determined with certainty. In most of the reported cases no cultures have been taken. We have in this case the original culture of the abscess, which was sterile, so that we have some evidence against a synchronous bacterial infection.

The gross appearances at operation were very interesting, I am going to ask Dr Faxon to tell about them.

DR HENRY H FAXON: We did not give the same imaginative thought to the problem that Dr Sturgis has, and with a tender right-lower-quadrant mass we were satisfied that it was an appendix abscess and it was drained. I should like to congratulate him on sorting out the salient features of the history—the mention of snails from South Africa, the bacteriology and the persistent sinus. We were surprised that with an abscess of appendiceal origin there was not more odor to the pus, and with a little more imagination we should have more properly evaluated the findings, but even at the time of discharge we felt that we had been dealing with an appendiceal abscess.

The reason for re-entry was to have an appendectomy performed in accord with our policy that if drainage of an appendiceal abscess has been performed without removal of the appendix, then appendectomy should be carried out two or three months after the first operation to prevent the more than likely chance of future attacks. At

Chari H. Über das Vorkommen von Oxyuren im menschlichen Eileiter. Virchows Arch f path Anat. 269:730-738 1928.
Goodale R H and Kriskner H. Oxyuris vermicularis in the peritoneum. Arch Path 9 631-634 1930.
Jones W J and Bunting C H. Invasion of the fallopian tube by Oxyuris vermicularis. Arch Path 11 229 235 1931.

the time of the first operation no effort was made to find the appendix. At the second operation we explored the peritoneal cavity, still laboring under the mistaken idea that we had drained an appendiceal abscess. When she came in the second time as Dr Sturgis logically pointed out, the sinus should have discharged fecal material or it should have closed had the original trouble been caused by her appendix. I made a paramedian incision and under the McBurney incision found the sinus tract matted with coils of intestine. These I freed and found that the sinus tract continued down to a point over the great vessels in the pelvis. There the sinus tract apparently entered into a lymph node in that region. There was a mass involving the right tube and ovary. The left tube was not strikingly abnormal save for small nodules along it. Similar nodules were more easily seen on the right side, where the mass was present. The uterus was tied down, chiefly posteriorly, by adhesions that could be separated fairly readily and seemed of long-standing rather than of short duration. When I saw the appearance of the pelvis the impression I gathered was that it was probably pelvic inflammatory disease. We asked one of the pathologists to come over, and I excised one of the small nodules that appeared on the tube and gave it to him to section. It was about 0.75 cm in diameter, and on section it was seen to have a well-formed wall with a caseous center. He was completely satisfied that it represented tuberculosis. At the end of the first operation the diagnosis was acute appendiceal abscess; at the second operation the diagnosis was tuberculous salpingitis, after about a week of making myself a nuisance to Dr Mallory we got as far as schistosoma salpingitis, and after a much longer period than Dr Sturgis took, we arrived at the correct diagnosis.

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Physical examination revealed a well-developed but somewhat emaciated woman sitting upright in bed, breathing rapidly, in obvious discomfort. The skin was dry and flushed, and the tongue

was rough and coated. The heart and lungs were negative, and the blood pressure was 126 systolic, 72 diastolic. The abdomen showed boardlike spasm and was moderately distended. There was diffuse tenderness, most marked in the left lower quadrant, and peristalsis was absent. Liver dullness appeared to be normal, and no fluid or masses could be made out. She was unable to lie flat in bed because of the abdominal spasm. Pelvic examination showed diffuse tenderness in both vaults. The fundus of the uterus could not be made out. There was exquisite tenderness on moving the cervix. Rectal examination showed tenderness with questionable bulging of the walls.

The temperature was 101.5°F, the pulse 120. The respirations were 20.

The urine examination was negative except for a very slight trace of albumin. The blood showed a red-cell count of 3,750,000 and a white-cell count of 29,700.

An x-ray of the abdomen showed the diaphragm high on both sides, although somewhat indistinct in outline because of hazy dullness in the lower lung fields. The costophrenic angles were shallow, and the upper lung fields were clear. The heart shadow was not remarkable. There was no evidence of free gas beneath the diaphragm.

During the two days following entry her temperature rose gradually to 104°F, and her pulse to 135. On the third day the nonprotein nitrogen of the blood was 22 mg per cent, and the chlorides were equivalent to 99 cc of N/10 sodium chloride. The white-cell count of the blood was 3300. She died on the fourth day.

DIFFERENTIAL DIAGNOSIS

DR. JOHN D. STEWART: When this patient was first seen she was not in shock, although she may have been after the onset of her abdominal pain, thirty-six hours previously. We see patients who, following the onset of an abdominal catastrophe, go into a state of shock which is compensated for during the subsequent day or two, only to recur perhaps as a terminal phenomenon. At the time of entry it is a perfectly good picture of peritonitis, there being nothing lacking to make the diagnosis.

DR. GEORGE W. HOLMES: This film was taken in the upright position and ought to show gas if present. The whole picture is that of a process below rather than above the diaphragm. The diaphragm is high, and its outline hazy. This might be extension of the inflammatory process to involve the diaphragm. I see no process in the chest to account for the haziness.

DR. STEWART: Could it be taken as evidence of basal atelectasis?

DR. HOLMES: It might, but I doubt it.

DR. STEWART: This is to me a very interesting picture. It involves the differential diagnosis of the acute abdomen. Time is short, so I will not attempt to go into the differential as fully as I otherwise might. It seems to me that the outstanding feature in the case on which we might base a diagnosis is sudden violent pain in a previously healthy person—a pain so severe that two doses of morphine and possibly sedatives by mouth were required to relieve it. Another important point is the rapid development of peritonitis, because I think it is fair to conclude that she died of general peritonitis. Another point of considerable interest to me is the fact that the gastrointestinal symptoms were minimal. She had reflex vomiting only immediately after the onset of the pain. She had no diarrhea, and passed no bloody material by rectum. Another very important point is the question of localization of tenderness. When you are confronted with such a picture as this, perhaps the most important point in making the diagnosis is localization of maximal tenderness, and that is often possible even in the presence of boardlike spasm and general tenderness. We are told that her maximum tenderness was in the lower abdomen, chiefly on the left, and a good deal is made of pelvic tenderness on pelvic examination. Those findings are probably very significant. Another interesting point is the shift in pain, which began in the epigastrium and subsequently was most marked in the lower abdomen. There are two questions that particularly come to one's mind in this case. One is why this patient was not operated on. It is possible that this was due to confusion in diagnosis and that when it became apparent that she had peritonitis it was considered better to treat her supportively. Another point of interest is the anemia, which apparently was real,—a red-cell count of 3,750,000,—if it is fair to assume it was not due to technical error.

In going over the differential diagnosis we can immediately exclude the extra-abdominal lesions which simulate acute abdomen. I do not believe this is coronary disease or diaphragmatic pleurisy or any of the other lesions above the diaphragm that produce abdominal symptoms. Likewise, I think we can exclude the urinary tract as the source of the symptoms. Then we are brought to the consideration of the classical trio of lesions which produce sudden severe abdominal pain in a previously healthy person, namely acute pancreatitis, perforation of a peptic ulcer and acute small bowel intestinal obstruction. With perforation of peptic ulcer it is not necessary to have a history of dyspepsia preceding perforation. Twenty-five to 50 per cent of the cases in various series of cases

do not give such a history. In regard to the matter of gas beneath the diaphragm—free gas in the peritoneal cavity—the fact that the x-ray does not show any does not exclude the possibility of perforated ulcer. In about 50 per cent of the cases of perforated ulcer we do not succeed in demonstrating this sign. However, I think a perforated ulcer would not be my first diagnosis, particularly because the patient apparently had lower abdominal tenderness dominating the picture at the time of examination and because the pain was chiefly lower abdominal during her course in the hospital. To be sure, exudate can flow down into the pelvis and produce peritonitis in that region as well as in the rest of the abdomen, but in perforated peptic ulcer the predominating tenderness ought to be near the site of perforation and the spasm there should be more marked. Acute hemorrhagic pancreatitis produces violent pain and immediate shock and the course is often brief, as it was in this case. One of the striking features of acute hemorrhagic pancreatitis is persistent nausea and vomiting. We should also have some story of pain in the back, and tenderness should have been most marked over the region of the pancreas rather than in the left lower quadrant. Without going into that further, I shall pass that by as not being the most likely diagnosis, although it is a good possibility.

Acute obstruction of the upper intestine could produce as violent a picture as this with very severe pain. Torsion of the small bowel may lead to immediate prostration with subsequent peritonitis, if not corrected by operation. This patient vomited only once, according to the story, and the pain presently became lower abdominal rather than upper abdominal. Nevertheless, I believe that strangulation of a part of the intestine without complete occlusion is a possibility. Internal concealed hernia, or Richter's hernia, can give this picture and go on to peritonitis, but I feel that that probably is not the most likely diagnosis. Primary pelvic lesions I shall also pass over as being unlikely. To be sure twisted ovarian cyst can produce sudden abdominal pain and may lead to peritonitis, but I believe that the development of peritonitis would take longer than apparently was required in this case, and furthermore there is no note of any palpable mass in the pelvis on pelvic examination. Other pelvic lesions such as ruptured ectopic pregnancy seem very unlikely. So we are reduced to a consideration of some perforative lesion of the gastrointestinal tract, or possibly of the gall bladder, with a rapid development of peritonitis. The question of acute cholecystitis or plugging of the cystic duct with stone and sub-

sequent rupture of the gall bladder would have to be considered. The attack of pain which she had had six weeks previously might have been on the basis of a cholecystitis. However it seems fair to expect that the examiner in the case would have detected greater tenderness in the abdomen in the region of the gall bladder and persistence of pain in the upper abdomen. Then there is the question of acute appendicitis with obstruction and possibly with fecalith in the lumen of the appendix. This would be a very unusual picture of acute appendicitis, but acute appendicitis is notable for its varied manifestations. We have seen patients operated on for perforated ulcer who have had obstructive appendicitis with perforation subsequent to the obstruction. In view of the predominance of tenderness and pain in the lower abdomen and particularly in view of the story of shift in pain from upper to lower abdomen I think that that is not an unreasonable diagnosis. There are unusual lesions which might produce the same picture, for example, perforation of an ulcer of a Meckel's diverticulum. Except for the fact that it is very rare, there is nothing wrong with making that diagnosis here.

I am unable to tie up the diagnosis with the anemia that the patient had unless she had had an ulcer in the gastrointestinal tract which had been bleeding and which subsequently ruptured. So I should say that this patient had diffuse peritonitis most likely following perforation of some part of the gastrointestinal tract, and that the appendix or a Meckel's diverticulum is as reasonable a source as any.

DR GEORGE W. W. BREWSTER: How about mesenteric thrombosis?

DR TRACY B. MALLORY: Do you raise that as a possibility, or is that your diagnosis?

DR BREWSTER: I think it is possible.

DR STEWART: I had considered that in my own mind and discarded it because of the lack of gastrointestinal symptoms. Also, I doubt if a patient would live four or five days with as fulminating a process as that usually is.

DR MALLORY: Of all the acute abdominal emergencies I think mesenteric thrombosis is the hardest to diagnose and the least often successfully diagnosed. That is what this patient had.

CLINICAL DIAGNOSES

Peritonitis, cause undetermined
Bronchopneumonia

DR STEWART'S DIAGNOSES

General peritonitis from perforation of gastrointestinal tract

Acute obstructive appendicitis?
Perforation of Meckel's diverticulum? '

ANATOMICAL DIAGNOSES

Mesenteric thrombosis, arterial and venous
Gangrene of ileum
Embolus to the superior mesenteric artery
Thrombosis of right adrenal vein with hemorrhage into adrenal
Arteriosclerosis moderate, aortic, with mural thrombosis
Peritonitis, acute focal
Nephritis, chronic vascular
Cortical adenoma of right adrenal
Pulmonary congestion and edema
Pleuritis, chronic fibrous, bilateral
Leiomyomas of uterus

PATHOLOGICAL DISCUSSION

DR MALLORY The terminal ileum for the last three feet was acutely inflamed and gangrenous. The superior mesenteric artery was occluded by clots evidently originating in an embolus, and the source of the embolus was a mural thrombus in the aorta immediately above and partly around the mouth of the superior mesenteric artery itself. There was a secondary thrombosis of the superior mesenteric vein which looked fresher than the arterial one. It extended the whole length of the vein and a short way up the portal vein, and had begun to extend into the splenic vein. That, however, was very recent. There were no changes in the liver or spleen. We found nothing to account for the anemia. The diagnosis on the ward was general peritonitis, cause undetermined. They refused to guess.

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WHAT PRICE STANDARDS?

THAT there is a group of persons vigorously opposed to raising the standards of qualification for practicing the healing art in Massachusetts is shown by the number and character of the bills introduced for consideration by the General Court this year.

It was in May, 1936, that the governor signed the bill creating an Approving Authority for colleges giving premedical education and for medical schools, and the effective date for the beginning of this authority was, then set by the statute as January 1, 1939. As that date draws near, renewed and intensive efforts are being made to bring to nought this legislation, which was designed to protect the people of the Commonwealth against improperly qualified practitioners of the healing art. Nine bills have been introduced, the result, if not

the intent, of which would be to expose the sick either to the risk of having continued the intolerably low standards of qualification for practice under which Massachusetts has suffered for decades and which other states have left far behind or in some branches of the healing art, to the risk of having treatment by less qualified persons than are at present permitted to practice.

The first, House Bill 758, proposes to postpone the effective date of the beginning of the activity of the Approving Authority for three years, that is, from 1939 to 1942. The present provision gives over six years to schools in which to make the changes that are necessary in order to receive approval. The bill became a law in 1936, and the provisions do not apply to candidates matriculating before January 1, 1939. Since most medical students matriculate in September, the class entering in the fall of 1939 will be the first one affected. At that time only the first year of the school will have to be approved, in September, 1940, only the first and second years, in September, 1941, only the first, second and third years, and the whole four year course not until September, 1942. If any school is seriously preparing to meet the generally accepted standards and is at all likely to meet them, six years and four months would seem to be a generous allowance of time. If the schools are asking for nearly ten years, it is a fair question to ask whether they will use the time to try to change themselves or to change the statute. That someone, perhaps some school, seeks to change the statute, making it of no effect so far as it concerns institutions in Massachusetts, is shown by House Bills 1084, 1133, 1195 and 1341.

There are now four non-approved medical schools in the United States, of which two are in Massachusetts. Why should these be given special privileges? Why should the people of Massachusetts be especially exposed to the danger of poorly qualified practitioners? Under ordinary circumstances no other state will admit recent graduates of these two Massachusetts schools to practice within its borders.

There are two bills (Senate 282 and House 759) seeking to create a separate board of registra-

Acute obstructive appendicitis?
Perforation of Meckel's diverticulum? '

ANATOMICAL DIAGNOSES

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Arteriosclerosis moderate, aortic, with mural thrombosis
Peritonitis, acute focal
Nephritis, chronic vascular
Cortical adenoma of right adrenal.
Pulmonary congestion and edema
Pleuritis, chronic fibrous, bilateral
Leiomyomas of uterus

PATHOLOGICAL DISCUSSION

DR MALLORY The terminal ileum for the last three feet was acutely inflamed and gangrenous. The superior mesenteric artery was occluded by clots evidently originating in an embolus, and the source of the embolus was a mural thrombus in the aorta immediately above and partly around the mouth of the superior mesenteric artery itself. There was a secondary thrombosis of the superior mesenteric vein which looked fresher than the arterial one. It extended the whole length of the vein and a short way up the portal vein, and had begun to extend into the splenic vein. That, however, was very recent. There were no changes in the liver or spleen. We found nothing to account for the anemia. The diagnosis on the ward was general peritonitis, cause undetermined. They refused to guess.

Senate 282—An act establishing a board of examination and registration in osteopathy. Public Health, February 17

House 758—An act relative to the qualifications of applicants for registration as qualified physicians. Public Health, March 1

House 759—An act creating a board of examination and registration in osteopathy. Public Health, March 1

House 85—An act relative to the practice of chiropractic. Public Health, March 5

House 1054—An act to preserve the rights of graduates of educational institutions chartered by the Commonwealth of Massachusetts. State Administration, February 23

House 1153—An act providing for special examinations for graduates of certain Massachusetts educational institutions. Education, March 5

House 1195—An act requiring boards of registration and examination to examine certain applicants. Public Health, March 1

House 1210—An act creating a board of examination and registration to regulate the practice of magnetic healers. State Administration, February 15

House 1341—"An act to further regulate the conduct of examinations by boards of registration of graduates of institutions of learning. This bill has not been printed and the exact wording of the title has not been stated. Education, March 5

PETTIFOGGING PETTY POLITICS

It is axiomatic that politics have no place in anything that concerns the health of the public. This is recognized by everybody except the less desirable type of politician.

Being necessarily intimately concerned with the health of the public in its more sensational aspects, the Boston City Hospital has always been the target for attacks by politicians. They have also tried to use its various departments as sources of reward for their creditor constituents. Such an attempt was made—early in its history—to control staff appointments. This, of necessity, failed and the staff has been completely free from such domination for a long time. Then the buying of supplies was tampered with. This too was corrected by impetus provided through the staff, a department of which exposed and forcibly stopped the sale of grossly infected low-grade milk. After the War it was notorious that the hiring and discharging of the lesser-paid employees rested in political hands, and the long, hard battle necessary to correct this evil has only recently been won. Finally, the custom of using hospital beds, private rooms and the services of the medical and surgical staffs

not only without any monetary compensation but even without the small courtesy of a "thank you" has also been stopped. This vicious racket involved politicians, their families, friends, neighbors and constituents and led directly to overcrowding the use of the hospital facilities by those not entitled to them, the giving of false addresses by patients and a resulting lack of efficiency in the care that the legitimate patients required. With a strict enforcement of the rule requiring payment of hospital bills every two weeks in advance and a thorough skilled investigation before admitting all non-emergency cases, this source of petty plunder, like the staff, the purchase of supplies and the control of non-civil-service employees, has been rudely taken away.

Only the nursing school remains as a means of granting favors. It is to be presumed that the nurses have been immune from this sort of thing in the past because, in the first place, they were ladies and it is hard to bring oneself to include ladies in schemes of this sort, and in the second place, all politicians up to the present had too much self-respect to stoop to such measures for the mending of their political fences. However, times are hard, a new city administration is starting, and economies, including salary cuts, are in the air. Reports have it that grave evil has been done to the taxpayers by the reorganization of the nursing school at the Boston City Hospital. It is difficult to understand how a reorganization that aims only to increase nurses' education and nursing efficiency, and that has been effected after prolonged and meticulous investigation by men experienced in all phases of hospital administration, can do the taxpayers anything but good.

It is time to put a permanent stop to such insensate baiting. The question today is not whether the nursing school at the Boston City Hospital is run well or badly. That can be safely left to the Trustees and staff. The question rather is: Shall patients be subjected to less and poorer care than they have every right to expect because the administration of the hospital is to be hamstrung every time some minor holder of political office takes it into his head to get some publicity?

tion for osteopathic physicians. Why do osteopaths seek this separation? They now fulfill the same qualifications for examination as do graduates of regular medical schools, they take the same examinations, and if registered, they practice under the same conditions—they may operate, give drugs, practice obstetrics, sign death certificates. They are eligible to sit on the Board of Registration in Medicine on exactly the same conditions as other physicians. What more can they possibly want? They ask for exactly the same rights and privileges, after registration, as other physicians possess, and they ask that all this be procured in an easier way. They want their own board to be the approving authority for their schools, in accordance with requirements which are notably and notoriously substandard. These bills represent an endeavor to escape from the jurisdiction of the Approving Authority, the creation of which the osteopathic profession opposed so vigorously in 1936. One of the bills (Senate 282) provides for registration without education,—high school, college or medical school,—without degree, and without examination.

Then there are the bills (House 854 and 1210) for the chiropractors and the magnetic healers. Both osteopathy and chiropractic, as such, are on the wane. They represent theories of the purely mechanical origin of all disease and are not to be classed with medical specialties which consider only a limited portion of the body and its functions. They treat any and all manifestations of disease in any part of the body as due to a single cause—the “osteopathic lesion,” or a subluxation of the spine as determined by “chiropractic analysis.” Materialism in its broadest sense is inadequate enough in explaining diseases of human beings, but when materialism is limited to mechanics, no one can take the theory too seriously. The magnetic healers are in a different class—they do not even claim an objective test of the power of magnetic healing. “I know I have the power of healing” seems to be the only test. As it would obviously be impossible for any individual or group of individuals to determine the presence of such a “gift” in another, it is difficult to comprehend how any board would be able to act in such a way

as to eliminate those self-designated healers who are disillusioned.

What should be, what shall be, the attitude of the medical profession toward these practitioners of the healing art? There can be only one reasonable position—all persons who desire to treat the sick in Massachusetts should meet certain minimum standards of qualification as to age, moral character, education, and proficiency as tested by examination. These standards should be the same for all. When the standards of qualification are once met and the practitioner once registered, he should be free to employ such methods of treatment as his intelligence, his training and his conscience indicate.

What should be, what shall be, the attitude of the public toward lowering of standards of practice for the healing art? It should be opposed, and will be opposed if the medical profession, to which it still looks for enlightenment on medical matters, can inform it intelligently and persuasively wherein the danger lies and in what the danger consists. The members of the medical profession should meet this responsibility squarely and carry it manfully, instead of shrugging their shoulders and saying pityingly, “If the public wants and prefers quacks and ignorant fellows to treat its ailments, let it have what it wants.” The physician has a social responsibility, which he must not shirk. All these bills are opposed by the Committee on State and National Legislation of the Massachusetts Medical Society. It is the duty of the district medical societies to send representatives to the legislative hearings in order to voice such opposition, and they should not fail.

The price of standards, ever higher standards, for the care of the sick and suffering is eternal vigilance and eternal warfare—unceasing warfare against prejudice and selfishness and greed and ignorance, against the debasing of standards for any cause—“ceaseless devotion to the cause of humanity.”

* * *

The bills, with abbreviated titles, the legislative committees to which they have been referred, and the dates of the hearings, are as follows

Senate 282—An act establishing a board of examination and registration in osteopathy. Public Health, February 17

House 758—An act relative to the qualifications of applicants for registration as qualified physicians. Public Health, March 1

House 759—An act creating a board of examination and registration in osteopathy. Public Health, March 1

House 837—An act relative to the practice of chiropractic. Public Health, March 5

House 1084—An act to preserve the rights of graduates of educational institutions chartered by the Commonwealth of Massachusetts. State Administration, February 23

House 1155—An act providing for special examinations for graduates of certain Massachusetts educational institutions. Education, March 5

House 1195—An act requiring boards of registration and examination to examine certain applicants. Public Health, March 1

House 1210—An act creating a board of examination and registration to regulate the practice of magnetic healers. State Administration, February 18

House 1341—An act to further regulate the conduct of examinations by boards of registration of graduates of institutions of learning. This bill has not been printed and the exact wording of the title has not been stated. Education, March 8

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not only without any monetary compensation but even without the small courtesy of a "thank you" has also been stopped. This vicious racket involved politicians, their families, friends, neighbors and constituents and led directly to overcrowding, the use of the hospital facilities by those not entitled to them, the giving of false addresses by patients, and a resulting lack of efficiency in the care that the legitimate patients required. With a strict enforcement of the rule requiring payment of hospital bills every two weeks in advance and a thorough skilled investigation before admitting all non-emergency cases, this source of petty plunder, like the staff, the purchase of supplies and the control of non-civil-service employees, has been rudely taken away.

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It is time to put a permanent stop to such insensate bawling. The question today is not whether the nursing school at the Boston City Hospital is run well or badly. That can be safely left to the Trustees and staff. The question rather is: Shall patients be subjected to less and poorer care than they have every right to expect because the administration of the hospital is to be hamstrung every time some minor holder of political office takes it into his head to get some publicity?

The answer can only be, No. The sooner and the more unequivocally the Trustees make that answer the more efficient will be the hospital, and the better the care and health of the Boston public—politicians included

NATIONAL DEFENSE WEEK

MILITARY medicine and civil medicine are so different that the practitioner flounders when the former is thrust upon him. Diagnosis and treatment en masse is entirely different from that in the office and home and cannot be learned in a few days—to say nothing of the paper work that is so exasperatingly puzzling.

All such things are brought to mind by National Defense Week, which, as usual, is being celebrated between February 12 and 22. It is sponsored by the Reserve Officers' Association to acquaint the public with the status and needs of national defense, and serves to drive home the point that the medical reserve officer in times of peace should take advantage of the courses that are made available to him for instruction in military medicine.

CORRECTION

In the paper by Wiggin and Tartakoff, entitled "The Use of Combined Pontocaine and Novocain for Spinal Anesthesia," which appeared in the January 27 issue of the *Journal*, the fifth line from the bottom in the second column on page 171, which reads, in part, "at a rate of 0.5 cc per minute," should be changed to read "at a rate of 0.5 cc. per second."

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No. 59 PLACENTA ABLATIO AT TERM

Mrs. W. B., a white woman, aged thirty-seven, in her twelfth pregnancy, was seen in the clinic on January 1, 1937, when two months pregnant.

A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

Her family history was essentially negative. Her past history was negative except for scarlet fever at fifteen years of age. Ten pregnancies and labors had been normal, and it was known that in the eleventh pregnancy the blood pressure had been normal and the urine had shown no albumin. Her periods had always been regular with a twenty-eight-day cycle, lasting five days without pain. Her last menses started on October 26, 1936, making the estimated date early in August, 1937.

Physical examination showed a well-developed and nourished woman. Her heart showed no enlargement, there were no murmurs. The hemoglobin was 90 per cent (Sahli), and the blood pressure was 116 systolic, 72 diastolic. The lungs showed no rales or dullness. The extremities were normal. Vaginal examination showed the uterus to be enlarged, consistent with her dates. Her urine showed a specific gravity of 1.008, there was no albumin or sugar, and no pus, blood or casts.

She was seen each month in the clinic until two weeks before the baby was due. At this time her blood pressure was found to be 176 systolic, 96 diastolic. There was no albumin in the urine. She was told to take plenty of rest, to restrict the intake of salt, to take a daily dose of Epsom salts and to return in one week. However, she did not return to the clinic.

On July 27, she entered the hospital at 1:45 a.m. with cramp-like abdominal pains occurring every three minutes, which had been present for one hour. Her temperature was 98.4°F, and her pulse 90. Uterine contractions were present but the fetal heart could not be heard. There was no discharge of blood or amniotic fluid. At 3:45 a.m. pains were harder, and a moderate amount of bloody discharge was present. At 5:00 a.m. bleeding was considerable in amount, the uterus was tender between contractions, and pain was continuously present. Her facies was pale and anxious, and her pulse was 100. Antepartum separation of the placenta was diagnosed. The membranes were ruptured artificially, and at 6:00 a.m. a mid-forceps extraction of a dead baby was easily performed, this was immediately followed by expulsion of the placenta and a large amount of dark blood, both fluid and clotted. As bleeding continued following the birth of the baby and the placenta, the uterus was thoroughly packed with gauze, and 1 cc. Ergometrine given intravenously.

For a while following this treatment, bleeding seemed under control, but the uterus did not contract satisfactorily, and by 7:35 a.m. she was bleeding through the packing, and the uterine fundus felt extremely boggy. At this time she showed signs of shock, with marked pallor and restlessness, a pulse of 150, and a blood pressure of 70.

systolic Morphine (1/6 gr) and Pituitrin (1 cc) were given hypodermically, the foot of the bed was raised, she was grouped for transfusion, and salt solution was started by the intravenous route running slowly so that she had 2,000 cc in one hour. At 8.30 a m her condition was unimproved, the vaginal flow was pinkish instead of red, but still continuous. Transfusion of 500 cc of citrated blood was given, followed by continuous, slow intravenous salt solution. Morphine (1/6 gr) hypodermically was again necessary. An improvement in color and pulse followed the transfusion, the pulse dropping to 128. For a while she rested peacefully. At 9.15 a m steady flowing again showed, this time it was bright red. She again became very pale, and the pulse became thready and uncountable.

It was apparent that the uterus did not have the power of contracting sufficiently to stop the bleeding and that she would die from hemorrhage unless it was checked. Hysterectomy was the only measure available, although it seemed impossible for her to stand the shock of operation. It was determined, however, to take the risk of operative shock, as it seemed her only chance of recovery.

At 10.00 a m another transfusion of 500 cc of citrated blood was started, the uterine packs were removed, and a supravaginal hysterectomy was performed under light ether anesthesia. The uterus was bluish black throughout most of its external surface, and the coloring extended into both broad ligaments and down onto the bladder peritoneum. On cutting the uterus, the entire wall was invaded by dark blood over a large part of the anterior and posterior uterine walls. Slow administration of intravenous salt solution followed the transfusion. Her color and pulse again improved during transfusion, the pulse dropping to 140, the blood pressure was 80 systolic. She was returned to bed with a pulse of 130 and a blood pressure reaching 100 systolic, 60 diastolic. Salt solution (1000 cc.) was given.

Recovery from the shock of hemorrhage and operation was fairly good. She showed a hemoglobin percentage of 45 on the following day and was given another transfusion of 500 cc of citrated blood. She took fluids well, but it was noticed that in the next few days her urinary output was very small. A catheter specimen of urine on July 29 showed a specific gravity of 1.009, a slight trace of albumin, no sugar and a sediment containing many red blood cells, an occasional white-blood cell and a few granular casts. The plasma protein of her blood was below the critical level of 5 gm per cent. Her blood pressure varied from 120 to 150 systolic, 70 to 80 diastolic. Her pulse ranged

from 80 to 100, and her temperature from 99 to 100°F. On July 29 she was given 300 cc of citrated blood, and her intake of fluid was decreased on account of the low blood protein and the small amount of urine.

On July 30 she seemed stronger, her intake and output of fluids were more nearly balanced. She showed no signs of edema and no rales in the lungs but had headache at times.

On July 31 she complained of severe headache, dizziness and epigastric pain, her blood pressure was 165 systolic and 80 diastolic. In the late afternoon she became confused, and had convulsive movements of her right arm and both legs with a generalized convulsion lasting five minutes, following which she was perfectly conscious. During the night she had six similar convulsions with partial consciousness between. There was no paralysis or disturbance of reflexes between convulsions. Her blood pressure varied from 150 to 180 systolic, 90 to 105 diastolic. She voided 450 cc. of urine showing a little albumin, many blood cells and a few granular casts. Her retinas showed no exudate, hemorrhage or abnormality of the arteries.

Treatment during the convulsive period consisted of morphine once, followed by magnesium sulfate (20 per cent) subcutaneously, in 10 cc doses intravenously at three-hour intervals for three doses. Lumbar puncture was done, dropping the spinal fluid pressure from 250 to 150 mm of water. This fluid showed no abnormalities. She was also given 100 cc of 50 per cent glucose intravenously twice.

On the following morning she was conscious and somewhat nervous but had no more convulsions. Her urine amounted to 20 cc., with findings as before, her blood pressure was 140 systolic, 70 diastolic. The blood urea nitrogen was 70 mg per cent.

Daily thereafter she showed steady improvement, passing normal amounts of urine and with a blood pressure varying from 145 to 160 systolic, 90 to 100 diastolic. On August 10 her blood urea nitrogen was 42 mg and her hemoglobin 55 per cent. She made a normal surgical convalescence from her laparotomy. She was discharged home with instructions to rest in bed, take iron and follow a low-protein diet. Her urine at this time showed a specific gravity of 1.005, no albumin or sugar, and nothing in the sediment.

On November 4, several months after labor and operation, she was seen at the clinic with the following results: her hemoglobin was 90 per cent, her blood pressure 164 systolic, 110 diastolic, heart normal, blood urea nitrogen 25 mg per cent, phenolsulfonphthalein 45 per cent in two hours.

Her catheterized urine showed a specific gravity, after fluid restriction, of 1 008, no albumin or sugar, and a sediment containing about 10 red-blood cells and leukocytes per high power field. Her retinas showed no exudate or narrowing of the arteries. Her general condition was very satisfactory.

Comment In reviewing the case, several important facts are evident.

There was a failure in prenatal treatment, in that following the discovery of hypertension she did not have careful enough treatment. She should have entered the hospital or at least have been seen more frequently.

Very extensive hemorrhage both into the uterine cavity and into the uterine musculature was present, and as a result, the uterine musculature lost its power of contracting so that bleeding did not cease with the birth of the child or with careful packing of the uterine cavity.

Thorough and persistent administration of intravenous salt solution and blood undoubtedly saved her from death and enabled her to stand the shock of hemorrhage and hysterectomy, the latter being the only measure effective in checking the bleeding.

The late occurrence of convulsions, associated with a high degree of uremia, suggests the presence of chronic nephritis, with the uremia possibly precipitated by the previous hemorrhage or treatment. The subsequent final examination confirms the opinion that she had an underlying chronic nephritis, the exact type of which still remains in doubt.

NOTICE TO FELLOWS OF THE MASSACHUSETTS MEDICAL SOCIETY

THE *New England Journal of Medicine* is sent to all fellows whose dues are fully paid. After March 1, delinquent fellows are dropped from the mailing list. All fellows are urged to remit their dues for the current year to their district treasurers before March 1.

CHARLES S. BUTLER, M.D., *Treasurer*

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning February 21.

BRISTOL NORTH

Thursday, February 24, at 4 00 p. m., at the Morton Hospital, Taunton. Subject: Pneumococcus Pneumonia and Serum Therapy. Instructor:

Frederick T. Lord. Arthur R. Crandell, *Chairman*

BRISTOL SOUTH (New Bedford Section)

Friday, February 25, at 4 00 p. m., at St. Luke's Hospital, New Bedford. Subject: Complications in Obstetrics Illustrated by Case Histories. Instructor: Raymond S. Titus. Robert H. Goodwin and Howard P. Sawyer, *Chairmen*.

ESSEX SOUTH

Course omitted this week on account of Washington's Birthday.

MIDDLESEX EAST

Course omitted this week on account of Washington's Birthday.

MIDDLESEX NORTH

Friday, February 25, at 7 00 p. m., at St. John's Hospital, Lowell. Subject: Gonorrhea in the Male. Instructor: Oscar F. Cox, Jr. William S. Lawler, *Chairman*.

NORFOLK

Friday, February 25, at 8 30 p. m., at the Norwood Hospital, Norwood. Subject: Bleeding in the Last Trimester of Pregnancy. Instructor: Raymond S. Titus. Hugo B. C. Riemer, *Chairman*.

NORFOLK SOUTH

Monday, February 21, at 8 30 p. m., at the Quincy City Hospital, Quincy. Subject: The Use and Misuse of Prontylin. Instructor: R. Cannon Eley. David L. Belding, *Chairman*.

PLYMOUTH

Course omitted this week on account of Washington's Birthday.

WORCESTER (Milford Section)

Thursday, February 24, at 8 30 p. m., in the Nurses Home of the Milford Hospital, Milford. Subject: Drug Therapy in Pediatrics. Instructor: Eli C. Romberg. Joseph Ashkins, *Chairman*.

WORCESTER NORTH

Friday, February 25, at 4 30 p. m., at the Burbank Hospital, Fitchburg. Subject: The Use and Misuse of Prontylin. Instructor: Benjamin W. Carey, Jr. Edward A. Adams, *Chairman*.

MISCELLANY

OPPORTUNITY FOR PHYSICIANS TO TOUR AMERICA EN ROUTE TO THE SAN FRANCISCO MEETING

The thought that the forthcoming American Medical Association session in San Francisco, June 13 to 17, is such a splendid opportunity for a tour of the United States, both going out and coming back, has inspired definite action. The co-operation of more than twenty-five state medical societies has made it possible to arrange a special train tour which will include such outstanding high lights of the North American continent as the Indian Detour, the Grand Canyon, Los Angeles, Riverside and Santa Catalina Island—on the way out to San Francisco. A choice of two return routes is possible, one of which

visits the charming cities of Portland, Seattle, Victoria and Vancouver and the beautiful scenic spots of the Canadian Rockies, the second route travels via Yellowstone National Park, Salt Lake City, Royal Gorge, Colorado Springs and Denver.

There is an all inclusive price for this tour which includes transportation from home town to home town though the tour starts officially at Chicago on Monday, June 6, from which point an American Express escort joins the group, as this travel company has been appointed transportation agent and the business details of the trip are in its capable hands.

Let us take a preview of the tour. The first day out of Chicago, racing across the broad wheat growing face of Kansas, we become acquainted with our traveling companions, physicians from other states, their families and friends and find ourselves among congenial, like minded people. We first leave our train at Lamy, New Mexico to enter the Indian pueblo district by motor coach. We spend a whole day exploring the traces left by a vanished civilization on this continent, visiting Santa Fe, Tesuque, Puye and Santa Clara Pueblo.

The next morning's arrival at the Grand Canyon will remain in our memories forever. The vast chasm, from four to eighteen miles wide from rim to rim, gives us stupendous vistas of awe inspiring beauty, unparalleled the world over. We drive over the famous Hermit Rim Road, skirting the edge of the chasm in the morning, and in the afternoon over the Desert View Road through the Tusayan National Forest and along the canyon's rim, stopping at Yavapai Point Observation Station for a short, interesting lecture by the park naturalist. This drive ends at the Watch Tower, a re-creation of the ancient towers erected by the prehistoric inhabitants of the Southwest.

The amazing city of Los Angeles is next on our itinerary, and our sightseeing trips acquaint us with its Spanish quarter and Chinatown, as well as its beautiful environs, including flowering Pasadena, Riverside, with its orange empire, lemon and grapefruit orchards, and famous Mission Inn, is another destination, and then, on our third day in California, we sail to beautiful Santa Catalina Island, playground of this land of the sun. And in this delightful manner, a week after leaving Chicago, we arrive at San Francisco in time for the meeting. We shall not discuss the interesting time that awaits us at our conclaves, as the object of this article is to describe the pre and postconvention tour. So we consider our return itinerary.

Supposing we had chosen Return Route No. 1. We shall visit Portland, Oregon, famed as the City of Roses and enjoy a drive along the noted Columbia River Highway. Seattle is next, and here we also cover all the points of interest, including both the lake and sound districts. Now the Canadian part of our journey begins, we sail by comfortable steamer to the cities of Victoria and Vancouver, where we do sightseeing. Now a train takes us into the enchanting scenic region of the Canadian Rockies and we stop at Chateau Lake Louise, at the lake of the same name—a gem of exquisite color, surrounded by green forests and snowy peaks. Our drives through the heart of the Rockies take us to Moraine Lake, the Valley of Ten Peaks, Johnson Canyon and finally to Banff, where we make another stopover. After additional sightseeing around Banff, we entrain for Chicago.

Return Route No. 2 takes us to Chicago in a more southerly route. A three-and-a-half-day tour of Yellowstone National Park is one of the high lights of this tour. Ranger naturalists conduct our party to the geysers and

hot pools, and we feast our eyes on Old Faithful in its hourly eruption. We also see the Grand Canyon of the Yellowstone and Mammoth Hot Springs. Salt Lake City is on our itinerary, which gives us an opportunity to visit Saltair Beach on Great Salt Lake, also the great copper mills and smelters. Our next call is at Colorado Springs, the noted health and pleasure resort. Our travels in the Rockies take us up to the summit of Pikes Peak, to the Garden of the Gods, to Seven Falls, and finally to Denver. This lovely city is a center for outings in the Rockies, and we are soon off on a sixty five mile tour of Denver mountain parks, including the memorial museum and tomb of Buffalo Bill of western fame. From Denver we travel to Chicago.

The above is barely a glimpse of the outline of the tours, but it is hoped that some idea has been given of the enjoyable travel awaiting those physicians and their families and friends, who wish to combine attendance at the meeting with an interesting journey and a happy vacation.

PRIZE SUBSCRIPTION

The *Journal* is offering a prize subscription for one year to the undergraduate contributing the best original article to the *Tufts College School of Medicine Medical Journal* during the current year. The award will be made annually. The editorial staff of the *Journal* will make the final selection from three papers recommended by the Tufts faculty advisers.

CORRESPONDENCE

SUGGESTED INSTRUCTIONS CONCERNING THE USE OF SULFANILAMIDE

To the Editor—Some time ago three members of the hospital staff were requested by the General Executive Committee of the Massachusetts General Hospital to submit suggestions concerning the use of sulfanilamide. Their report was so comprehensive and clear that copies were made and forwarded to all staff members. A copy is enclosed in the hope that it may be of interest and value to readers of the *Journal*.

N. W. FAXON, M.D., *Director*
Massachusetts General Hospital,
Boston

* * *

- I *Drugs to be used*—Sulfanilamide (Merck)
Prontylin (Winthrop Chemical Company)
Prontosil (Winthrop Chemical Company), rarely
- II *Diseases in which it should be employed*
 - 1 Gonococcal infections, particularly arthritis
 - 2 Meningococcal infections, particularly meningitis
 - 3 Acute or subacute infections due to beta hemolytic streptococci.
 - 4 The drug is still to be regarded as under trial for Type III pneumococcus, *B. coli*, *B. proteus*, *B. welchii* and *B. typhosus*.

Whether or not all cases of chronic prostatitis due to the gonococcus can be cared for with sulfanilamide remains to be seen. We have observed a few failures. They may represent inadequate therapy. Time will tell.

- III *Dosage*—Until we have further information concerning the smallest amount of the drug necessary to cure any of the above mentioned infections, it would seem wisest to prescribe the

drug in full doses. Full doses are calculated as follows: $\frac{3}{4}$ gr per pound of body weight, not exceeding 120 gr in any 24 hour period. The exact length of time such treatment must be continued is unknown, probably 1 or 2 weeks of such therapy is adequate.

IV Method of giving It is preferable to administer the drug by mouth. The daily calculated dose should be subdivided into four or six equal parts and given at 6- or 4 hour intervals. In rare instances, when the patient seems to be in immediate danger of death, it may be advisable to give the full dose at once, or half the full dose at the beginning of treatment and the other half 4 hours later. The patient should then go on to a fourth and sixth of the full dose at 6- or 4 hour intervals.

Sodium bicarbonate may be given in equal doses with each dose of sulfanilamide, if desired. The soda has no known effect upon the pharmacologic action of the drug and may allay the severity of the gastric symptoms and prevent the acidosis attendant upon the use of sulfanilamide.

If the patient is vomiting, a 0.6% solution of sulfanilamide (Merck) in saline may be auto-claved and given subcutaneously as a clysis, or if desired, Prontosil may be injected intramuscularly.

V Suggested laboratory studies

- 1 A complete blood examination should be done before starting the drug and should be repeated every 3 to 7 days.
- 2 If there is any question of renal impairment or of acidosis, nonprotein nitrogen, chloride and carbon-dioxide-combining power determinations should be done on blood samples and should be repeated, as seems indicated, in order to evaluate renal function and the degree of acidosis.
- 3 Blood sulfanilamide determinations are not absolutely necessary. The maximum blood value is probably attained between 24 and 72 hours after the institution of therapy. Therefore, such a determination made during this period and repeated occasionally should give one an excellent idea as to the existing blood concentration. From the data at hand, it would appear that the blood level should be maintained at 5 mg per 100 cc. or above. On full doses, most patients vary between 8 and 15 mg free sulfanilamide per 100 cc. of blood. Excessive fluid intakes tend to decrease the blood sulfanilamide level, and therefore it is probably wise not to administer fluids excessively, a total 24 hour fluid intake of from 2000 to 3000 cc would seem adequate.

VI Contraindications

- 1 Severe anemia and leukopenia
- 2 Marked renal impairment.
- 3 Obstructive jaundice.

VII Incompatible drugs No type of sulfate medication, such as magnesium sulfate, ferrous sulfate, and so forth, should be administered during the time the patient is receiving sulfanilamide because it increases the incidence of sulfhemoglobinemia.

VIII Complications

- 1 Cyanosis. Sulfhemoglobinemia is the most frequent cause, but actual discoloration of the cells may account in part for the cyanosis.
- 2 A moderate acidosis is encountered in a fair number of the patients receiving the drug, rarely does the carbon-dioxide-combining power of the blood drop below 40 vol. per cent.
- 3 Gastric symptoms are frequent, although rarely severe. They usually consist of nausea and loss of appetite, vomiting is occasionally encountered.
- 4 Various skin eruptions as well as urticaria have been encountered. The exact manner in which these are produced is unknown. When present, the drug should probably be discontinued.
- 5 Sustained fever as high as 103 or 104°F may be encountered during the administration of the drug. It disappears promptly on discontinuance of it.
- 6 Hemolytic anemia has been observed. Anemia is frequently encountered, and varying grades of leukopenia have been seen. The leukopenia may appear after the discontinuance of the drug.
Severe anemia is a contraindication to further use of the drug.
- 7 A rising blood nonprotein nitrogen should be considered as a possible contraindication to further use of the drug.

WALTER BAUER, M.D.,
CHAMP LYONS, M.D.,
E. ROSS MINTZ, M.D.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

To the Editor In addition to the articles enumerated in our letter of January 12 the following have been accepted

Abbott Laboratories

Brucella Melitensis Bacterin—Abbott
Bismuth Subsalicylate with Butyn D.R.L., 30 cc. bottle
Bismuth Subsalicylate with Butyn D.R.L., 500 cc. bottle
Dextrose 20% W/V in Distilled Water
Dextrose, USP, 25% W/V in Physiological Sodium Chloride Solution
Dextrose 2½% in Physiological Sodium Chloride Solution
Metaphen Ophthalmic Ointment

B. L. Benson

Glycyrrhiza Compound Extract Squares

International Vitamin Corporation

I V C Cod Liver Oil Concentrate Capsules
I V C Cod Liver Oil Concentrate in Oil

Lederle Laboratories

Rabies Vaccine—Lederle (Semple Method), 7 vials package

Eli Lilly & Co

Combined Diphtheria Toxoid Tetanus Toxoid-Alum Precipitated, one 5 cc. vial package

Mallinckrodt Chemical Works

Sulfanilamide—Mallinckrodt

Mead Johnson & Co
Mead's Compound Syrup Oleum Percomorphum
Merck & Co, Inc.
Vinethene (Merck), three 10 cc. bottles package
Parke, Davis & Co
Staphylococcus Toxoid
Solution Adrenalin Chloride 1 100
E. R. Squibb & Sons
Ampule Sterile Solution Procaine Hydrochloride —
Squibb, 10 per cent, 2 cc.
Winthrop Chemical Co., Inc.
Pontocaine Hydrochloride Tablets, 0.1 gm
PAUL NICHOLAS LEECH, *Secretary*
535 North Dearborn Street,
Chicago, Illinois.

RECENT DEATH

HOPKINS — BERTRAND H. HOPKINS, M.D., of 24 Wash-
ington Street, Ayer, Massachusetts, died August 13, 1937
He was in his fifty sixth year
Dr Hopkins received his degree from Tufts College
Medical School in 1897
He was a fellow of the Massachusetts Medical Society
and a member of the American Medical Association

REPORT OF MEETING

BOSTON UNIVERSITY MEDICAL SOCIETY
"Observations on the Diagnosis and Treatment of Brain
Tumors" was the subject of an address given by Dr Gil-
bert Horrax of the Lahey Clinic before the monthly meet-
ing of the Boston University Medical Society on February
7 in the Evans Memorial Auditorium. Dr Reginald Fitz
presided at the meeting
The student officers of the society are president, Rob-
ert E. Moss, Boston, vice president, John P. Rattigan,
Hyde Park, corresponding secretary, Timothy L. Curren,
Dorchester, secretary, Marion V. Zottoli, Dorchester, re-
gional delegates, Nicholas Fiumara, Boston, Deborah V.
Rubenstein, Roxbury, and Frederick J. Fagan, Norwich.
Connecticut forum committee, Sidney Gohn, New York
City, Morris Taylor, Chelsea, John Dougherty, Bath, Maine,
Iver S. Ravin, Brookline, and Isabel S. Money, Mattapan

NOTICES

CLINICS FOR CRIPPLED CHILDREN
IN MASSACHUSETTS UNDER THE
PROVISIONS OF THE SOCIAL SECURITY ACT

CLINIC	DATE	ORTHOPEDIC CONSULTANT
Haverhill	March 2	Arthur T. Legg
Lowell	March 4	Albert H. Brewster
Salem	March 7	Harold C. Bean
Gardner	March 8	Mark H. Rogers
Brookton	March 10	George W. Van Gorder
Springfield	March 16	Garry deN. Hough, Jr.
Worcester	March 18	John W. O'Meara
Pittsfield	March 21	Francis A. Slowick
Hyannis	March 22	Paul L. Norton
Fall River	March 28	Eugene A. McCarthy

UNITED STATES CIVIL SERVICE
EXAMINATION
Physiotherapy Aide, \$1,800 a Year
Applications must be on file with the United States
Civil Service Commission at Washington, D. C., not later
than March 7

Applicants must have been graduated from a school of
physiotherapy meeting the standards established by the
American Medical Association, or they must have had at
least eighteen months experience as classified pupil aides
in physiotherapy in a Veterans Administration facility

CARNEY HOSPITAL

The monthly clinical meeting and luncheon of the Car-
ney Hospital staff will be held on Monday, February 21,
at 11:30 a. m., in the Andrew Carney Assembly Hall

PROGRAM

Case Report: Compound fracture of skull with convulsions,
decompression and recovery. Dr. W. E. Browne.
Pathology Exhibit.
Fluid Balance. Dr. T. J. P. Lyons.
Discussion by Dr. N. A. Welch, Dr. C. A. Robinson and
Dr. John Thornton
Physicians and medical students are cordially invited to
attend.
R. J. HEFFERNAN, M.D., *Secretary*

NORFOLK DISTRICT MEDICAL SOCIETY

The next regular meeting of the Norfolk District Medi-
cal Society will be held in the Beth Israel Hospital, on
Wednesday evening, February 23, at 8:15

PROGRAM

Business
Communication: Dermatitis venenata due to cosmetic and
industrial irritants. Dr. John G. Downing. Discus-
sion by Dr. Francis P. McCarthy
Collation
FRANK S. CRICKSHANK, M.D., *Secretary*

ROBERT B. BRIGHAM HOSPITAL

There will be an open meeting at the Robert B. Brig-
ham Hospital, 125 Parker Hill Avenue, Boston, on Thurs-
day evening, February 24, at 8:15. Dr. Maurice B.
Strauss will speak on "Vitamin Deficiencies."
Doctors and medical students are cordially invited to
attend.
ROBERT SANDERSON, M.D., *Secretary*

TRUDEAU SOCIETY

The next meeting of the Trudeau Society will be held
in the auditorium of the Beth Israel Hospital on February
24 at 8:15 p. m. Dr. Everts A. Graham, editor of the
Journal of Thoracic Surgery and professor of surgery at
Washington University School of Medicine, will speak on
"The Problem of Bronchiogenic Carcinoma." The paper
will be discussed by Dr. Edward D. Churchill and Dr.
Richard H. Overholt.
MOSES J. STONE, M.D., *Secretary*

BOSTON MEDICAL HISTORY CLUB

There will be a meeting of the Boston Medical History
Club at the Boston Medical Library, 8 Fenway, Boston,
on Wednesday, February 23, at 8:15 p. m.
Dr. Chester M. Jones will speak on "The Development
of Our Knowledge of the Gastrointestinal Tract and Its
Diseases."
BENJAMIN SPECTOR, M.D., *Secretary*

NEW ENGLAND SOCIETY OF PSYCHIATRY

The annual spring meeting of the New England Society of Psychiatry will be held at the Neuro-Psychiatric Institute of the Hartford Retreat, Hartford, Connecticut, on April 26

GEORGE A ELLIOTT, M.D, *Secretary Treasurer*

BOSTON SOCIETY FOR THE ADVANCEMENT FOR GASTROENTEROLOGY

The Boston Society for the Advancement of Gastroenterology will hold a meeting in the amphitheater of the new surgical building of the Boston City Hospital, on Thursday, February 24, at 12 o'clock noon Dr Maurice Binet will lecture on "Liver Deficiencies" Dr Binet is chief physician at Vichy and a medical doctor at the Faculty of Paris

C. W McCLURE, M.D, *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, FEBRUARY 21

MONDAY FEBRUARY 21

- *11:30 a m Carney Hospital monthly clinical meeting and luncheon Andrew Carney Assembly Hall

WEDNESDAY FEBRUARY 23

- *9 10 a m Boston Dispensary Hospital case presentation Dr S J Thannhauser
- *12 m. Clinicopathological conference. Children's Hospital Amphitheater
- 8 15 p m Norfolk District Medical Society Beth Israel Hospital Boston
- 8 15 p m Boston Medical History Club Boston Medical Library 8 Fenway

THURSDAY FEBRUARY 24

- 8:30-9:30 a m. Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Peter Bent Brigham Hospital
- *9 10 a m Boston Dispensary Gastrointestinal clinic Dr h S Andrews
- 12 m. Boston Society for the Advancement of Gastroenterology Boston City Hospital Amphitheater of the new surgical building
- 8 15 p m Trudeau Society Beth Israel Hospital auditorium Boston.
- *8 15 p m Robert B Brigham Hospital 125 Parker Hill Avenue Boston.

FRIDAY FEBRUARY 25

- *9 10 a m Boston Dispensary The Diagnosis of Multiple Myeloma Dr Bernard Jacobson
- 10 a m 12 30 p m Tumor clinic Boston Dispensary
- 8 p m Massachusetts Psychiatric Society Boston Psychopathic Hospital

SATURDAY FEBRUARY 26

- *9 10 a m Boston Dispensary Hospital case presentation Dr S J Thannhauser
- 10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A Christian

SUNDAY FEBRUARY 27

- 4 p m Illustrated public health lecture Faulkner Hospital auditorium Backache Dr John D Adams
- 4 p m Free public lecture Harvard Medical School amphitheater of Building D Pain in the Abdomen Dr Channing Frothingham and Dr Richard H Miller

Open to the medical profession

FEBRUARY 17 — Boston Society of Psychiatry and Neurology Boston Medical Library 8 Fenway at 8 15 p m

FEBRUARY 17 — New England Pathological Society amphitheater of Malory Institute of Pathology Boston City Hospital 8 p m

FEBRUARY 21 — Carney Hospital Page 321

FEBRUARY 22 — New York University College of Medicine. Alumni Day Page 245 issue of February 3

FEBRUARY 23 — Boston Medical History Club Page 321

FEBRUARY 24 — Boston Society for the Advancement of Gastroenterology Notice above.

FEBRUARY 24 — Trudeau Society Page 321

FEBRUARY 24 — Robert B Brigham Hospital Page 321

FEBRUARY 25 — Massachusetts Psychiatric Society Page 245 issue of February 3

MARCH 1 — Greater Boston Medical Society Beth Israel Hospital auditorium 8:30 p m

MARCH 3 — George Washington Gay Lecture. Page 245 issue of February 3

MARCH 10 — Penetucket Association of Physicians Hotel Bartlett, 95 Main Street Haverhill 8 30 p m

MARCH 10 11 12 — New England Hospital Association Page 51 issue of January 6

MARCH 28 APRIL 1 — Postgraduate Institute of the Philadelphia County Medical Society Page 282 issue of February 10

APRIL 4-8 — The American College of Physicians. Page 41, issue of July 1

APRIL 26 — New England Society of Psychiatry Notice above.

MAY 31 JUNE 1 and 2 — Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston.

JUNE 13-17 — American Medical Association San Francisco.

JUNE 13 OCTOBER 8 and NOVEMBER 15 — American Board of Ophthalmology Page 282 issue of February 10

OCTOBER 17 21 — Clinical Congress of the American College of Surgeons, New York City

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5 — 5 p m New Bedford.

ESSEX SOUTH

MARCH 2 — Lynn Hospital. Clinic at 5 p m. Dinner at 7 p m. Speaker and subject to be announced.

APRIL 6 — Gloucester Hospital Gloucester Clinic at 5 p m. Dinner at 7 p m. Speaker and subject to be announced.

MAY 5 — Censors meet at Salem Hospital, 3:30 p m.

MAY 11 — Annual meeting Salem Country Club, Peabody Dinner at 7 p m Speaker and subject to be announced.

FRANKLIN

Meetings will be held at the Franklin County Hospital Greenfield, at 11 a m the second Tuesdays of March and May

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club Stoneham, at 12:15 p m on March 16, and May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell, on April 27

NORFOLK DISTRICT

FEBRUARY 23 — Page 321

MARCH 29 — Hotel Kenmore. 8 15 p m. Subject to be announced but to be related to diseases of the kidney Dr Albert A. Horner

MAY — Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon

MARCH 3 — Norfolk County Hospital, South Braintree.

APRIL 7 — At the Quincy City Hospital

MAY 5 — Annual meeting

PLYMOUTH

Meetings will be held at 11 a m on March 17 April 21 May 19 and July 21

SUFFOLK

MARCH 15 — Joint meeting with Boston Obstetrical Society

WORCESTER

At the following meetings except the annual meeting dinner will be at 6 15 to be followed by business session and scientific program

MARCH 9 — Memorial Hospital Worcester

APRIL 13 — Hahnemann Hospital Worcester

MAY 11 — Afternoon and evening annual meeting Place and schedule of program to be announced

BOOKS RECEIVED FOR REVIEW

Love and Happiness Intimate problems of the modern woman 1 M. Hotep 235 pp New York and London Alfred A. Knopf, 1938 \$2.00

Fever Therapy Abstracts and discussions of papers presented at the First International Conference on Fever Therapy, March 29, 30, 31, 1937 Walter M. Simpson, William Bierman, et al 486 pp New York Paul B Hoeber, Inc., 1937 \$5.00

BOOK REVIEWS

4 *Bibliography of the Works of Ambroise Paré Premier Chirurgien & Conseiller du Roy* Janet Doe. 266 pp Chicago The University of Chicago Press, 1937 \$5.00

Miss Doe has written a very valuable book. It is much more than a bibliography, for she has listed with extraordinary accuracy not only every known edition of Paré's works, but, in describing these books, she has added notes of unusual value on the author's life and on the times. She points out, for instance, that Paré was a man of great versatility, that he began as an unlearned barber surgeon and rose to be the idol of the army surgeons of France, and surgeon to the French kings for nearly forty years. Although he is best known for his rejection of boiling oil for the treatment of wounds and the use of the ligature and of podalic version, he is equally the epitome of Renaissance surgery, for in his simple and kindly manner, in spite of his being at times vain and ambitious, Paré brought common sense to surgery and took away from it the muddy thinking of the Middle Ages. Although at first unlearned as a writer, his style grew with him, and his later books, published after 1560, were well written. Miss Doe writes that his realistic story of the siege of Metz can fearlessly be compared with the greatest narratives of history. The golden thread running through it all is the personality of the author. Much of interest in regard to the man will therefore be found in this splendid book.

The bibliography is unusually complete. Miss Doe has searched for copies of the various editions and works in libraries throughout the world with unusual pertinacity. She has also ascertained the number of copies in the hands of private collectors. Foremost among these is Dr Harvey Cushing, whose unusual collection was used as the basis for most of the descriptions written by Miss Doe. Each book is described in complete detail and in most cases the title page is reproduced, the copies used are indicated and also the number and location of all copies found. There is little to criticize in this splendid piece of research, the result of many years of effort by an extremely conscientious individual. Unfortunately, the faults, if any, fall upon the press. Much of the type is badly chosen, and the title pages are poorly reproduced. There are a number of criticisms in regard to the bibliographical style used by the author, but these are minor and relatively unimportant. With such splendid examples before her as the bibliographies issued in recent years by Geoffrey Keynes, particularly those of William Harvey and Sir Thomas Browne, it seems a little unfortunate that Miss Doe did not follow in detail the style set by her predecessor. In spite of these criticisms, which must be acknowledged as being definitely minor, except for the printing, the book is one of the outstanding bibliographies of our time and as such sets a standard that few will equal and practically none surpass.

Genital Abnormalities, Hermaphroditism, and Related Adrenal Diseases Hugh H. Young 649 pp Baltimore The Williams & Wilkins Co., 1937 \$10.00

This is an extraordinary book. Written by the author of one of the best textbooks of urology, it represents another outstanding achievement by Dr Young. Over five hundred original drawings by Mr William P. Didusch make this volume one of the best illustrated medical works we have seen.

Fifty three personal cases form a unique collection of genital abnormalities and dysfunctions of the most unusual kinds. These rare anomalies are described as hermaphroditism, male and female pseudohermaphroditism, hermaphroditism verus, and adrenogenital syndrome, and the more common genital abnormalities such as hypospadias, epispadias, cryptorchidism, and, so forth. The embryology of hermaphroditism is well described with clear diagrams and illustrations. This astonishing array of cases is illustrated by photographs and drawings, many of which were made at the operating table. Each step in the operating technic is portrayed clearly enough to aid anyone who attempts such surgery.

The anguish of the unfortunate individuals described by Dr Young can be imagined. Boys have been brought up as girls only to discover that they had been wrongly classed sexually, or were of indeterminate sex. One patient was brought up in a male orphanage until operation disclosed a uterus, tube and ovary. The child was then dressed as a girl and transferred to a female orphanage. At the age of seventeen a hernia operation revealed that the supposed ovary was a testicle, and the patient again assumed male attire. Such are the tragedies Dr Young has described. As a master craftsman he has righted the wrongs of nature by the many ingenious and original operative procedures, which he has so ably described in this book.

Minor Maladies and Their Treatment. Leonard Williams. Seventh edition. 439 pp Baltimore William Wood & Co., 1937 \$3.75

The author of this work gives as its *raison d'être* the fact that when he went into practice he found himself moderately well equipped in the diagnosis and treatment of the diseases which he most seldom encountered, but ignorant in those matters about which he was frequently consulted. So this book is devoted to a discussion of such subjects as colds, coughs, sore throats, indigestion, constipation, neuralgia and headache. The author writes in a simple, conversational style and adds bits of experiences acquired through years of practice, still, it is rather surprising that a work like this has gone on to the seventh edition.

4 *Primer for Diabetic Patients An outline of treatment for diabetes with diet, insulin and protamine zinc insulin including directions and charts for the use of physicians in planning diet prescriptions* Russell M. Wilder Sixth edition reset. 191 pp Philadelphia and London W B Saunders Company, 1937 \$1.75

This new edition of Dr Wilder's book was made necessary by the addition of protamine insulin in diabetic treatment. In the nine sections are given, in the simplest and most direct language, discussions of the nature of diabetes and its treatment by diet and insulin. Various important complications of diabetes, including a brief section on the hygiene of the feet, are given adequate space as well as special dietary problems for children and for weight reduction.

A Monograph on Veins Kenneth J Franklin 410 pp
Springfield and Baltimore Charles C Thomas, 1937
\$6 00

Dr Franklin has long been a leader in investigation of the anatomy and physiology of the veins. His book is the culmination of many years of intensive work and brings together not only his own extensive experiences but also a complete review of the entire subject, a summary that is not to be found between the covers of any other volume. Known also for his interest in the history of medicine, there is a distinct historical trend to be noted on almost every page. Although perhaps primarily a book for the physiologist who is working on the functions of the veins, there is much material here that will interest the clinician who is actively interested in keeping in the front rank of research. The surgeon and the neurologist, moreover, will find much of value. The book, published in a sumptuous fashion, with excellent illustrations and replete with historical data, becomes a valuable part of the medical historian's library. Unique in character, reflecting sound research, this volume should have a wide appeal to the medical profession.

A Text-Book of Ophthalmic Operations Harold Grimsdale and Elmore Brewerton Third edition. 322 pp
Baltimore William Wood & Co, 1937 \$6 00

This well written third edition, containing 105 line drawings, constitutes an excellent manual for current practice in ophthalmic surgery. The first seven chapters deal with surgery of the ocular adnexa (muscles, eye lids, conjunctiva, lacrimal apparatus), including enucleation, and the remaining five chapters, comprising about one half the text, deal with surgery upon the eye itself (cataract, glaucoma, detached retina and intraocular foreign bodies).

If one comment were allowed for improvement in the text, it would seem to take the direction of a condensation of items of purely historical interest, and an elaboration of items in the last five chapters dealing with preoperative and postoperative care. For example, the utilization of bionicroscopy preoperatively and postoperatively and the interpretation of surgical complications in terms of tissue pathology would seem to add greatly to the usefulness of the text.

The Postmortem Examination Sidney Farber 201 pp
Springfield, Illinois, and Baltimore Charles C Thomas, 1937 \$3 50

This is a scholarly piece of work which can be highly recommended. The book begins with a historical introduction, deals with the signs of death, the equipment for autopsy technic and care of bodies, the regulations governing postmortem examinations, the procedure of viewing a body, the removal of organs, their section, the examination of the skeleton, special technics including a short summary of medicolegal procedures, a chapter on postmortem examination in infants and children with appendices giving the weights of organs, the standard procedure for postmortem examinations as adopted by pathologists and undertakers in New York City and, finally, a copy of a typical autopsy protocol by Virchow.

There are minor faults, such as the implication that in adults the rib cartilages can be readily sectioned by a knife and the indication that removal of the organs of the neck is a standard and usual procedure in autopsy technic. However, these are of slight importance in a book which is remarkable for its thoroughness, its documentation with good bibliographies, and the practical character of its instruction.

The Traffic in Health Charles Solomon 393 pp New York Navarre Publishing Company, Inc., 1937 \$2.75.

This book is put out with a gaudy jacket showing the silhouette of a cloaked skeleton holding a bottle which is surrounded by an effulgence which might be mistaken for a halo. It is extremely timely and is a mine of information. Unfortunately, the writing is dull and in catalogue fashion, classified according to the ailments which drugs are supposed to benefit. Many interesting facts are obtained by a study of this volume, all of them pointing to the great necessity of a revision of our laws to protect the public. Even though the reviewer has been in touch with this field for years, he found many new facts recorded in this book. It is worth the perusal of every physician in order that he may aid in the appropriate education of his patients and guard them from the unscrupulous manufacturers of patent medicines.

Materia Medica, Pharmacology, Therapeutics and Prescription Writing For students and practitioners Walter Arthur Bastedo Fourth edition, reset. 778 pp Philadelphia and London W B Saunders Company, 1937 \$6.50

This is a new edition of a standard text brought well up-to-date, including even the recent work on sulfanilamide. The present edition follows the previous ones, and like all pharmacological texts, studies the complete action of each drug, grouping the various drugs according to their customary use or chief action in treatment. The therapeutic discussion is more extensive than in most English texts and is on the whole satisfactory though some of the recommendations would be disapproved in ultra-scientific clinics. The discussion of flavoring and prescription writing is unusually clear.

The Endocrines in Theory and Practice Articles republished from the *British Medical Journal* 278 pp Philadelphia P Blakiston's Son & Co, Inc., 1937 \$3.50

This book is a joint effort by the English workers in endocrinology to fill the crying need for something which the general practitioner can turn to in order to keep up-to-date in this field. It corresponds in many respects to *Glandular Physiology and Therapy*, published in 1935 by the American Medical Association, which comprised a series of similar articles by the American profession. The book is lucid, up-to-date, accurate, and not too comprehensive. Its list of authors includes the names of many who have contributed widely to endocrinology. It should be a valuable asset to anybody interested in this field.

The Baby's First Two Years Richard M. Smith 121 pp Boston Houghton Mifflin Company, 1937 \$1.75

For more than two decades Dr Smith's manual on infant care has been widely and favorably known in these parts. In many households it has been, so to speak, standard. And indeed it answers most of the questions concerning feeding, habits and general management which are likely to arise in the normal course of events. Its aim is to supplement, not to supplant, personal advice from the physician. For this latest edition the subject matter has been revised or entirely rewritten to accord with the most recent accepted opinion. Safe, sane and authoritative, this little book of reference can be enthusiastically recommended to anyone who is charged with the care of a baby.

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THE DEVELOPMENT OF MEDICINE AND ITS TRENDS IN THE UNITED STATES, 1636-1936

HENRY E. SIZERIST, M.D.*

BALTIMORE

IT IS indeed a pleasure and privilege to be able to participate in the tercentenary celebration of this great and beautiful city, and I am particularly pleased with the fact that the medical profession has been given such a prominent place in this celebration. A few hours ago we deposited a wreath at the grave of the first doctor whose name has been recorded in this city. This was not a mere gesture. It had a profound significance, since it showed that not only are the noted doctors who make the outstanding discoveries remembered, but the humble practitioner as well—the practitioner who puts their teachings into practice. It showed also that we medical men, wherever we may stand, are members of one family. We know little about Dr. Leonard's life and work, but we know that he was a physician, that he was one of us, serving the same ideals that we serve.

Three hundred years is a short period in history, yet what tremendous changes have been brought about during that time! Three hundred years ago came the first settlers, William Pynchon sailing up the river, landing here and founding a new Springfield, today we see a thriving city with many industries, beautiful homes, numerous hospitals, and sixteen medical organizations. Three hundred years ago in this vast country were virgin forests, prairies and deserts, all inhabited by a few Indians. Today there are highways and railroads everywhere, large cities, a highly developed industry producing forty per cent of the world's output. If there ever was an epic in the history of mankind, the conquest and the opening up of the American Continent was such an epic, infinitely more dramatic than the Trojan War.

Just as interesting as the history of the American continent is the history of American medicine. I must confess that ten years ago I knew little

about American medicine. Some of this country's outstanding contributions were known to me, as to everybody else— anesthesia, some new operations, the work of Gerhard, Nathan Smith and a few other men. I used daily the *Index Catalogue* of the Library of the Surgeon-General's Office, by far the best medical bibliography existing, that it was produced in an army office is a fact unparalleled in history. I had friends in America, among them Colonel Fielding H. Garrison, who has contributed so much to the history of medicine. The inspiration to study this history came to me from Dr. William H. Welch, who in 1927 visited me at the University of Leipzig. He told me of his plan to establish an Institute of the History of Medicine at Johns Hopkins University. He told me of his own work that is so intimately connected with half a century of American medicine, and invited me to be visiting lecturer at Johns Hopkins some day when the new institute was functioning. I had no idea at that time that I should be called to succeed Dr. Welch in the chair of the history of medicine, but I devoted a number of years reading everything on the subject I could find, and studying the books of American medical pioneers. Since then I have traveled all over this country, and my interest in American medicine has been ever increasing. Our Institute will begin publishing this year a series of reprints of American classics that should be in the hands of every doctor.

What makes the history of American medicine so fascinating is that in various periods tremendous difficulties had to be overcome— difficulties due to the size of the country, to its rapid expansion, to the general problems of colonization. We should expect that a new country would be able to take advantage of all the experiences of the older countries. The settlers who colonized America were Europeans, in full possession of the benefits of European civilization. We should expect them to have continued the cultural life of Europe at the point where they had left it. Yet we must not

Presented at the Medical Profession's Observance of the Tercentenary of the Founding of Springfield, May 18, 1936, at Springfield, Massachusetts.

William H. Welch, Professor of the History of Medicine and director of the Institute of the History of Medicine, Johns Hopkins University, Baltimore.

forget that civilization depends not only on men but also on institutions. England had its Oxford and Cambridge, and had had them since the Middle Ages. There were libraries all over Europe, and they had been there since the early Middle Ages. There are still libraries in Europe containing manuscripts written more than ten centuries ago. There were medical schools all over western Europe. And western Europe, besides, was a small territory where the young men eager to learn could easily travel from one center of learning to another. Here in America there was wilderness, hostile Nature, hostile Indians. Physicians and books were rare, and the settlers were poor. They had to start at the bottom. In three hundred years American medicine repeated the development of three thousand years of European medicine in all its phases.

If we look at conditions during the Colonial period, we find the parallelism between European and American development most strongly marked. During the early Middle Ages the medical man was as a rule a cleric, and in the same way there was a period of clerical medicine in New England. The clerics represented the educated part of the population. They were called upon to give help in the case of illness, and the chronicles have transmitted the names of quite a few of them, including Deacon Samuel Fuller, Thomas Thacher and Cotton Mather. Sometimes a governor was asked for advice in case of sickness, as is interestingly revealed, for example, in the correspondence of John Winthrop, Jr. There was a period in ancient Greece when physicians were craftsmen, educated as such by serving a master as apprentice for a number of years. At the time of the American Revolution there were about three thousand five hundred physicians in the colonies, of which not more than four hundred were graduates of universities, the others, like the disciples of Hippocrates, had been educated by serving apprenticeships with physicians, a system which undoubtedly had some advantages. While in Europe medicine and surgery were entirely different arts, often antagonistic, in America physician and surgeon were one, and even late in the nineteenth century the surgeon usually had a general practice as well.

Another parallel is to be found in the development of hospitals. The European "hospitals" in the early Middle Ages were xenodochia—guest-houses, poorhouses to provide food and shelter to the indigent. Medical treatment in such places was merely incidental. It was not until much later that true hospitals were erected. In this country as early as 1612 such a guesthouse was built in Henricopolis, Virginia. An almshouse was founded in 1732 in Philadelphia, and similar institutions

were created in New York and New Orleans in 1736. They were not hospitals in the modern sense of the word, but poorhouses similar to the old European xenodochia. The first real hospital was the Pennsylvania Hospital, which was opened in 1752, and was succeeded by the New York Hospital in 1791.

In the same way, the first medical text printed in the colonies was not a textbook but a broadside—Thomas Thacher's *A Brief Rule to Guide the Common People of New-England How to order themselves and theirs in the small pox, or measles*,—just as the incunabulum of European medicine was not a large book but a single leaf with instructions for venesection, printed in 1456.

If medicine in the early colonial days appears somewhat primitive, we must not forget that it was not on a much higher standard in Europe. What was the medical situation in 1636? Eight years had passed since Harvey had made known his discovery of the circulation of the blood. The experimental approach to medical problems had just been initiated. Less than a century had passed since Vesalius had published his seven books on the structure of the human body, laying the foundation for a new system of medicine. While science—and primarily physics and chemistry—was applied more and more to the solution of biological problems in the seventeenth century, a work that centered in the academies founded during the century, medical practice was then on a rather low level, and not without justification were the physicians of the time satirized by the poets. It was only from the middle of the century on, and chiefly under the influence of Thomas Sydenham, that the standard of practice was raised.

The development of medicine in the colonies was perfectly sound. Every effort was made to create institutions that would compare favorably with those in Europe. The spirit of the colonies was progressive, as is shown by the fact that inoculation for smallpox was introduced in Boston as early as 1721, before anyone had been inoculated in western Europe. The new Pennsylvania Hospital compared favorably with most of the similar European institutions. It was carefully planned, and the men responsible for this and other new hospitals went abroad to study conditions there, their reports are most revealing. They were most anxious to avoid the mistakes made abroad. The first medical school founded in this country—in Philadelphia in 1765—was better than many European ones. With Morgan, Rush, Shippen, Adam Kuhn and Bond it had a faculty of men well trained abroad and full of enthusiasm for their task. The school was not intended to replace the apprentice system, it completed the

student's medical education. A young man still went to a physician as apprentice for a number of years, and then entered medical school to integrate his knowledge and to study the theory of medicine. The hygienic movement that swept over Europe in the second half of the eighteenth century found its immediate repercussion in America where philanthropists like Benjamin Franklin and Benjamin Rush were strong supporters of such reform.

After the American Revolution medicine had to face fresh problems. The country expanded westward. The frontier became a decisive factor in American life, and was pushed forward relentlessly. The population increased very rapidly and new territories of tremendous dimensions had to be conquered and settled. We find fascinating personalities in medicine in these frontier days—men like Ephraim McDowell, who in 1809 performed the first ovariectomy in a log cabin in Kentucky, and William Beaumont, who studied the gastric juices while stationed at a frontier fort. Most impressive of all to me is Daniel Drake. Morgan, Rush, McDowell even, had been trained abroad. Daniel Drake was a pure product of the American soil. Brought up in Kentucky, and trained in Cincinnati, he had a clear vision of the future task of medicine. He recognized that the Mississippi Valley was to be the melting pot of the nation. What part was the physician to play in this development? No doubt the country would require more physicians, many more than the Eastern schools were able to train. New schools would have to be founded. Drake himself was an enthusiastic teacher. There was hardly a subject in medicine that he did not teach. Called to academic positions thirteen times, he occupied nine chairs in five medical schools, and founded two schools. Drake then visualized another serious task. This enormous new territory that was to be a living-place for millions of people would have to be made a healthful country to live in. Sanitation, however, required knowledge, and not only medical knowledge but knowledge of the geographic, climatic, ethnologic and social conditions of the region. Drake himself undertook such a study, and his treatise on the diseases of the Mississippi Valley is one of the classics of medical literature.

This sudden development of medicine had serious drawbacks, as it prevented a gradual and normal movement. More physicians were needed, and more and more schools were created. About four hundred medical schools were founded during the nineteenth century—twenty-seven in Indiana, thirty-nine in Illinois and not less than forty-two in Missouri. It is obvious that most of these schools could not be of very high standard.

Everywhere doctors joined in the movement, rented rooms, admitted students and gave diplomas to men who had spent hardly two years in study. Still more serious was the abandonment of the apprenticeship system. The schools no longer completed the student's education, as they had done in colonial times. No wonder that the standards of these hurriedly trained physicians were low. There were some distinguished doctors in this period, as there had been before, but the average physician was poorly prepared. At the time of the Civil War, when in Europe medicine was progressing with gigantic strides, medical conditions in America were chaotic.

After the Civil War a readjustment took place. This was a slow process, entailing endless difficulties. American society was busy developing material resources, building up industries, improving the standard of living. Science pursued for science's sake found little response. In 1876 John Billings wrote "Culture, to flourish, requires appreciation and sympathy, to such an extent, at least, that its utterances shall not seem to its audience as if in an unknown tongue."

The readjustment came from three different sources—the medical profession, the state medical societies and the medical schools. The profession as such felt that conditions must be changed if the profession was to have a respected place in society. As early as 1845 the Medical Society of the State of New York invited every medical society and school of medicine in the Union to send delegates to a general congress of physicians to be held in New York, at which ways and means of improving conditions in medicine were to be discussed. Another congress was held the following year in Philadelphia, and led to the foundation of the American Medical Association in 1847. Resolutions were passed but nothing was achieved. The Civil War interrupted this development, but the foundation of the American Medical Association had a decided significance in providing a forum for discussion and awakening the conscience of physicians. Local societies were organized in increasing numbers, and in the readjustment after the War these societies played an important part.

Another effort to improve conditions was made by the states in requiring a state license for the practice of medicine. Recognizing that the diplomas issued by the schools had little value, the states examined candidates through their boards of registration. This was not new in American medicine, for New Jersey had required a license as early as 1772, but here again a sound development had been interrupted, and one hundred years had to elapse before the requirement of a state license became general. Texas was the first state after the War to require a license.

in 1873 Others followed in rapid succession, so that by 1895 practically all the states had laid down similar requirements

But it was not enough to postulate better standards Places had to be created for the training of fully qualified physicians This is what gave to Johns Hopkins Medical School, opened in 1893, its national significance It was founded primarily as a center of medical research, and was equipped with all the facilities required for such research The student body was small, the requirements for admittance were high, and the teaching staff included some of the best men in the nation, among them William Welch, William Osler, William Halsted, Howard Kelly, John Abel, Franklin Mall and William Howell — men who had had the best training that Europe could give, and who transplanted the spirit of the European universities to America without slavishly copying their methods They succeeded in improving upon the European systems of medicine, blending the principles of German, English and French schools in a most fortunate way Most of these men have left us today, but their spirit still lives as an inspiration to the school The example set by the Johns Hopkins Medical School was soon followed by other schools The curricula were thoroughly reorganized, and in 1901 the Rockefeller Institute for Medical Research was founded

Today medical research is carried out by thousands of young people with tremendous enthusiasm We have excellent schools, and as a result, well-trained physicians, nurses and public-health officers American medicine gave the world the public-health nurse, whose value for the people's health cannot be overestimated The standard of the hospitals was materially raised through the efforts of influential organizations like the American College of Surgeons, the American Medical Association, and others The new medical science required a new type of hospital, serving not only the indigent sick but all classes of the population It is no exaggeration to state that American medicine today is without doubt the best-equipped in the world

Does this mean that all problems have been solved, that we can look back on the past with self-satisfaction? By no means, on the contrary, it seems to me that in our day a new frontier has opened up and must be settled We have all the equipment that we can wish for, our problem is to apply it so as to benefit the entire population

As we have seen, the whole development was

chaotic and unplanned, one result was that the number of physicians increased tremendously, so that we now have one for every 760 inhabitants Have we too many? I do not think so, for medicine has many more tasks to solve than it ever had before If it has had a distinguished past, it has a still more distinguished future Public health has developed very rapidly, assuming more and more tasks, and coming ever nearer to the individual The physician's expert advice is sought in education, in the prevention of crime, in the enforcement of law Serious public-health problems have been solved Spectacular diseases like plague, yellow fever, smallpox and typhus have been overcome, but there are still tuberculosis and the venereal diseases, the hygienic problems of housing and nutrition remain unsolved Hygiene and public health had to overcome great difficulties in this country, owing to its size and to its heterogeneous population, but they could build upon the solid foundation of a rational philosophy, and a democratic political organization in which the welfare of the individual has extreme weight

We have to realize that conditions are very different from what they were half a century ago Medical science has become extremely technical and specialized As a result, medical service has become increasingly expensive At the same time, the structure of society has undergone profound changes The frontier has come to an end, and immigration has virtually stopped, so that American society, formerly in constant flux, has become stabilized A paradoxical situation is developing in that medicine through its own progress is becoming too expensive, and therefore unavailable to large sections of the population Another adjustment will have to take place This time, it is not a matter of equipment and science, but a social problem that must be solved

But I am confident that the American people will solve this problem as they have solved others For this is a wonderful country, inhabited by fine men, intelligent, hard-working, with a plentiful endowment of common sense and idealism The spirit of the men who three hundred years ago founded this city, of the men who in three hundred years have developed it to what it is today, and of the medical men who for three hundred years have devoted their lives to improving the people's health, is not dead It is alive, ready to improve conditions, to create new values, conscious both of the heritage of the past and of the tasks that lie ahead

RENAL CANCER

End Results in 105 Consecutive Cases

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THIS study is a continuation of the excellent report of the end results on hypernephroma published by Smith in 1925. From the beginning of 1925 to the end of 1935, 105 patients on whom a definite diagnosis of renal cancer was made were admitted to the Massachusetts General Hospital. This series includes only those cases where the diagnosis was verified by the pathologist, or where a characteristic pyelogram was supported by sufficient clinical evidence.

Of these 105 patients, 72 were submitted to a nephrectomy, 10 had an exploratory operation, 3 had biopsies, and in 20 cases no operation was done. End results are available in all but 6 cases. Of the patients who had nephrectomies (Table 1), 45

available in 1 case. All 20 unoperated patients died within fifteen months except 1, who lived for three years.

The histopathology of this series (Table 3) showed 7 Wilms's tumors in children, 5 adult sar-

Table 2. *End Results of Cases without Operation and Those Explored and Biopsied*

	NO OPERATION	EXPLORATION	BIOPSY
Died in hospital	7	4	0
Died after discharge			
1-6 mo	9	6	1
6-12	2	0	0
15	1	0	0
3 yr	1	0	0
6	0	0	1
No follow up	0	0	1
Totals	20	10	3

Table 1. *End Results of Nephrectomies for Renal Cancer*

END RESULT	TIME	NO OF CASES
Dead		45
First yr		37
2 to 3 yr		3
5 yr		2
7 yr		1
8 yr		1
14 yr		1
Living		22
1 to 2 yr		3
2 to 3 yr		4
3 to 4 yr		5
4 to 5 yr		3
5 yr		4
6 to 7 yr		2
9 to 10 yr		1
No follow-up		5
Total		72

are dead, 22 are living, and there are no follow-up reports in 5 cases. Of the 45 dead, 37 died within the first year, 3 within the second and third years, and 5 developed metastases after five years. Of the 22 living patients, 7 have gone beyond the five-year period, 10 have passed the fourth year, and 5 are living and well without demonstrable clinical recurrence after three years.

An exploratory operation was performed on 10 patients (Table 2), 4 of these died following the exploration, and 6 died at home within the first six months. Of the 3 patients on whom the diagnosis was made by biopsy, 2 died—1 three months after the biopsy and 1 six years after it (the latter case illustrates how slow-growing some adenocarcinomas and hypernephromas can be), no follow-up is

comas, 1 epidermoid and 7 papillary carcinomas of the renal pelvis, and 65 adenocarcinomas or hypernephromas. In the 20 unoperated cases no pathological report was available, as the diagnosis of renal tumor was made by pyelogram, and clinical signs and symptoms. All the children with a Wilms's tumor died within six months after the nephrectomy. Of the 5 adults with sarcoma, 4 died within the first year, and 1 lived two years and nine months and died in diabetic coma. This

Table 3. *End Results in Cases of Renal Cancer, Arranged According to Type of Tumor*

TYPE OF TUMOR	NO OF CASES	END RESULTS
Wilms's tumor (children)	7	All dead.
Sarcoma (adults)	5	All dead. 1 lived 2 yr 9 mo. and died of diabetes.
Epidermoid carcinoma of renal pelvis	1	Living over 5 yr. no clinical evidence of recurrence.
Papillary carcinoma of renal pelvis	-	Four living and well (6 yr 4 yr 6 mo 3 yr 3 mo and 1 yr 3 mo. respectively). Two died postoperatively—1 had no operation.
Adenocarcinoma or hypernephroma	65	Five are living and well over 5 yr. 5 lived over 5 yr. and died of metastases.
No report	20	
Total	105	

All but 1 had a nephrectomy—1 had a ureterectomy and segmental resection of bladder.

patient had no demonstrable recurrence. Four of the 7 patients with a papillary carcinoma of the renal pelvis are living—six years, four years and six months, three years and three months and fifteen months, respectively. The single patient with an epidermoid carcinoma of the renal pelvis

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is living after five years, and recent x-ray examination of the chest and pelvis failed to reveal any metastatic process. Among the 65 patients with an adenocarcinoma or a hypernephroma, 10 lived more than five years, but 5 of these died later of metastases.

Of the entire series, regardless of the type of lesion, 12 patients lived more than five years, and only 7 are now alive and comparatively well. This high mortality was the incentive for further study as to end results.

Every available article listed in the *Index Medicus* and in the *Index Catalogue* of the Library of the Surgeon-General's Office has been reviewed. I pass over the early literature on the subject, including that of Israel, Garceau, Albarran and Imbert, Guillet, Richards, Héresco, Legueu, Denaclara, Chevalier, Hedrén and many others. These articles are very interesting but in a sense disappointing. The operative mortality at the time these men wrote was extremely high. With the increase in our knowledge of operative technic and methods, the operative mortality has definitely decreased. With this decrease one would expect to see a relative increase in the number of ultimate cures. This, however, has not occurred. Berg reported 25 patients with renal cancer, all of whom were dead in seven years. In Paschen's series of 268 collected cases, only 17 per cent were free from recurrence after three years. Pleschner reported 17 per cent cures at the end of three years and 5 per cent at the end of five years. In a series reported by Smith and Shoemaker there were only 7 cases out of 62 that lived over five years, 4 of these died later on from recurrence. Hyman in 42 postoperative cases reported only 9 per cent of five-year cures. Bull recently reported 37 cases of kidney tumor, of which only 5 are free from recurrence—three, thirteen, twelve, eight, and eight years, respectively.

Muir and Goldsmith had 16 per cent cures in 37 cases. Swan showed 20 per cent cures in 51 cases. In the 25 cases reported by Lazarus, there were no five-year cures, however, some patients in this series were operated on recently and may later prove to be cured. Rafin presented 20 cases, 4 of which (20 per cent) went beyond the five-year period. Kimball and Ferris showed that in their series of 74 cases of papillary carcinoma of the kidney there was recurrence in 75 per cent of those who had only a nephrectomy (40 cases), 68 per cent of those who had a nephrectomy and ureterectomy (25 cases), and only 25 per cent in those who had a nephrectomy, a ureterectomy and partial segmental resection of the bladder. Of the 8 cases of papillary carcinoma reported by Scholl, only 2 were free from recurrence, these patients had survived two and a half and four months, respectively. Mock

was able to report on 23 of 25 operative cases for papillary carcinoma of the renal pelvis. He traced 18 of these and found that only 5 patients remained well, but he did not state the postoperative duration. In the 45 cases of pelvic papillary tumors reported by Cabot and Allen, only 8 patients lived more than five years. Geschickter and Widenhorn report only 4 five-year cures in 84 cases of cortical tumor of the kidney (hypernephroma and adenocarcinoma), 3 of the 4 patients had metastases. MacKenzie in his series of 27 cases reports only 4 that he believes can be considered as cured, but many of the cases have been operated on recently, and there may well be more cures. Chute was able to report only 5 five-year cures in 43 cases. Wright in his 19 cases of hypernephroma had only 3 five-year cures. In 15 cases reported by Phillips there were no five-year cures. In the 57 cases of squamous-cell carcinoma of the renal pelvis reviewed recently by Gilbert and Macmillan there were no five-year cures. This tabulation of results could be carried on indefinitely to embrace such articles on the subject as those written by Roth and Schwoerer, Thomas and Regnier, Kretschmer, Scholl and Foulds, McCown, Stricker, Lindstrom, Ipsen, Michaelsson, Ljunggren, Hryntschak, Fedoroff, Key, Nevinny, Cutler, Deuticke, Warner, Carson, Dóza, Fischer, Demel, Grauhan, Heppner, Lubarsch, Nicolich, Sysak and Jurkewytch, and Swift-Joly. Suffice it to say that all the reports in the literature show the dreadful mortality of this disease.

I shall not go into the question of Wilms's tumor in children, for the mortality in this type of tumor is well known. The number of cures reported could easily be tabulated on one small page. We are led to believe that certain forms of renal cancer are more curable than others. We all know the terrific mortality of Wilms's tumors and the almost equal mortality of the sessile tumors of the renal pelvis, but we are in the dark as to the actual curability of papillary tumors of the renal pelvis, and especially the cortical tumors, such as hypernephroma and adenocarcinoma. I am sure that the number of cures in the cortical tumors would be further reduced if the reports as we find them in the literature had covered more than five years. There are innumerable reports of recurrence either in the operative scar or by metastasis in patients who have gone beyond the five-year period, particularly in cases with adenocarcinomas or hypernephromas.

Why this tremendous mortality? The answer, I believe, is not difficult. In the first place, inability to make an early pathological diagnosis is the *bête noir* of this disease. We may have been deceiving ourselves in believing that an early clinical diagnosis indicates an early pathological one. Noth

ing could be farther from the truth. An illustration of this point is the case of a male patient of thirty-eight who entered the hospital with a history of hematuria of three days' duration. He was otherwise perfectly well, and on entry had not an ache or a complaint. He was operated on and a moderate sized renal adenocarcinoma was removed. The patient was well for four years and



Figure 1. Small adenoma found at necropsy

then developed metastases to the brain and lungs. Although the clinical diagnosis was made early, the pathological process was fairly well advanced.

It is true that renal cancer is diagnosed much earlier now than it was before the introduction of the cystoscope, yet a casual glance through the present-day literature will soon convince any skeptic that the great majority of patients with renal cancer have a fair-sized growth when first seen or operated on. This does not mean that there is an exact relation between the size of the neoplasm and the ultimate prognosis, but it gives some indication of how long the process has gone on. It is fair to assume that the longer the duration of the neoplastic process, the greater the chance for venous and lymphatic extension. The small renal tumors that are found at necropsy, as illustrated in Figures 1 and 2, are almost never seen at operation or diagnosed clinically. The reasons are obvious. They rarely give clinical symptoms, and we have no means at our disposal to visualize them by x-ray. It would be the ideal procedure to make a diagnosis before these growths have produced their characteristic deformities of the excretory portion and contour of the kidney, as seen by x-ray. It is precisely at this stage that operative cure could probably be effected in most cases. I say "most cases," for in some instances the lesion may be small and yet the patient may have diffuse metastases. Fortunately this is the exception.

Another factor which prevents early diagnosis and indirectly increases the mortality is the insidious nature of the disease. The number of patients with renal cancers that fall into this group is not small, and they defy the acumen of the best

clinicians. They present no urinary signs or symptoms, but are diagnosed clinically when the disease affects other organs. I know of no cancer that can give as little warning as a renal cancer. Creevy in a very excellent paper has recently rediscovered and illustrated this point. These patients may have presenting symptoms such as cough, neurologic ailments or gastrointestinal disturbances. In 9 out of his 38 cases, Creevy found that the patients first sought his advice because of symptoms referable to the lungs, usually in the form of cough, pain in the chest or hemoptysis. We have had cases in our series that are illustrative of this point. One, a woman, fifty years of age, was seen by her doctor for cough of one year's duration. Physical examination revealed a large left kidney, and x-ray examination of her chest showed a metastatic nodule. There was no history of hemoptysis. It is extremely rare, however, to have hemoptysis due to a secondary metastatic nodule in the lung, whereas most of the primary bronchiogenic tumors do produce hemoptysis. This point is worthy of note. Creevy states

There is no doubt that a fairly high percentage of the cases of renal neoplasm will continue to escape recognition until late in their course, not merely because patients are prone to delay medical consultation, and because the disease often produces syndromes difficult to identify, but chiefly by reason of the fact that the first symptom to attract the patient's attention is so often due not to the tumor itself but to a metastasis or local extension. This was the case in 33 per cent of the cases in the clinical series, in 50 per cent of those in the autopsy series and in 41 per cent of those in the whole group—a disconcertingly high proportion.

Our series, too, is with other large series in the literature, includes cases in which the diagnosis



Figure 2. Small adenocarcinoma found at necropsy

was made after metastasis had taken place. A child of two and a half years complained of limping of the right leg of two weeks' duration. X-ray of the upper end of the femur showed a lesion, which was interpreted as being either an early tuberculosis, an early osteomyelitis or a beginning

primary tumor Abdominal examination revealed a fair-sized mass in the right upper quadrant, which at operation proved to be a Wilms's tumor of the kidney In one case, a man of sixty-seven developed an enlarged supraclavicular lymph node, which on biopsy proved to be metastatic hypernephroma In another, a woman of sixty-six, a diabetic, complained of "stomach trouble" for three and a half years Palpation of the abdomen revealed a huge right-upper-quadrant mass, which at operation proved to be a fibrosarcoma of the kidney In still another, a man of sixty-three entered with a chief complaint of constipation over a period of many months He had no urinary symptoms but his abdomen was markedly distended Physical examination revealed an enormous mass occupying the right upper quadrant, and x-ray examination showed metastases to the spine and lungs

The literature, both past and present, is replete with such case records Chukry cites the case of a man fifty years old who during defecation felt a sudden numbness of the arms and legs and had a definite left hemiplegia He had no symptoms referable to the genitourinary tract. At autopsy a renal cancer was found with extensive metastases to the brain, lung, mediastinal glands and myocardium Johnson cites the case of a Negress, sixty years of age, who had a spastic paralysis of both legs of four days' duration and a microscopic hematuria Physical examination revealed a huge mass in the right lower quadrant—kidney cancer Radimska-Jandova and also Barjon and Japiot add similar cases with neurological symptoms Wodsack included in his 54 cases a number of patients with extensive metastases, but without any urinary symptoms Metastatic skin nodules (Cochez and Busser, Lubarsch), extreme anemia (de Luna), cough (Harvier and Lemaire), pleurodynia (Shuman) and hoarseness (Turner, Memzel) may be the first symptoms of renal cancer Simpson cites an interesting case of a boy who was unable to move his leg owing to partial collapse of the first and second lumbar vertebrae A small renal tumor was removed which on microscopic examination proved to be a spindle-cell sarcoma The boy died a few weeks later In his comment Simpson stated "Such a lamentable result after removal of a tumor, only four days after the first symptom, makes one wonder whether we are justified in telling the public that the cure of cancer is only a question of early diagnosis" I believe that we are justified in so doing provided we keep forever in mind that we seek an early pathological diagnosis and not an early clinical diagnosis

The third factor that indirectly increases the mortality rate is that we have very few, if any,

early symptoms This is of course true of practically all types of deep cancer Braasch once pointed out that hypernephromas usually grow slowly, and in their early stages cause few if any, clinical symptoms The classic triad of hematuria, tumor and pain which are described in every textbook on renal cancer means very little so far as early diagnosis is concerned

According to Neff, "a patient is lucky whose kidney tumor causes bleeding in the early growth." Hematuria is the one symptom which is so often stressed in the literature Both the laity and the physician have been told time and again of the necessity for investigation when urinary bleeding is present. In fact, it has not been uncommon in the past to accuse physicians in small communities of not investigating a hematuria and thus making more nearly possible an early diagnosis I am strongly in favor of investigating every case of bloody urine, but I am not so sure that this will increase the chances of successful diagnosis of early pathologic lesions, especially of cortical tumors We must remember that in order to have hematuria from a cortical tumor the lesion must extend into the renal pelvis or its appendages, or, as shown by Patch and Rhea, produce bleeding by congestion of the subepithelial spaces In our series the urinary sediment was negative in a fair percentage of cases By this is meant that no erythrocytes could be found in the urines of these patients when they entered the hospital This does not necessarily signify that they had not had hematuria at some other time, but simply that when they were first seen no red cells were found in their urines, nor did they give a history of hematuria

Gross hematuria was present in only a small group of cases This is very significant It may be that in this particular series the incidence of hematuria was low, but in the literature, report after report can be found where a fair percentage of the cases did not have macroscopic bleeding In view of this last statement, how can anyone make an early diagnosis in these cases? The fact is that we do not make it, in a number of our cases the growth was of fair size and the patient had only recently complained of hematuria Quite a number presented hematuria as the initial symptom, yet on physical examination a large tumor mass was present Nearly all these cases were in the parenchymatous group

This shows strikingly that the symptom—mass or tumor—was not sufficient in itself to bring the patient to the doctor, but that the addition of hematuria was Hematuria, although a fortuitous sign, as stated by Neff, does not necessarily mean an early tumor even though it is a presenting symptom and of quite recent date The patient who had one of the largest tumors in this series had his first hematuria three days before death

In Wilms's tumors in children, hematuria is not a very early symptom. Prather and Crabtree found it in only 15 per cent in their group of 111 cases. In Mixer's series of 41 cases and in Schippers's cases, hematuria was present in 2 per cent and 10 per cent, respectively.

The value of tumor as a sign in the early diagnosis of kidney cancer is likewise small. Patients as a rule do not continually examine their abdomens for tumor, and the chances are that when a mass is palpated the lesion has gone on for a considerable time. The growth has probably extended beyond the capsule or into the venous system. There are obviously exceptions to this rule, but in the main it must be conceded that the very finding of a tumor mass militates against an early lesion. It may be an early diagnosis so far as the physician is concerned, but it is not an early pathologic process. This is well illustrated in the Wilms's tumors found in children. We all know that the chief complaint in this type of tumor is an increasing swelling of the abdomen due to a large mass. We know also the dreadful prognosis in these cases. The number of reported cures in the past thirty years can be counted on two hands and the total number is probably not greater than twice those reported. This is an appalling fact.

Pain as an early symptom I believe to be of extremely doubtful value. It is the chief complaint in most cases of epithelioma of the renal pelvis. As it is a subjective symptom, it depends entirely on the individual's threshold for pain. Persons with a slight degree of pain usually carry on for a long time before they consult a doctor. Invariably they hope that the pain will pass off, and attribute it to some other cause. Fortunately most pain does pass off and no cancer develops, but only when the pain is severe or hinders his daily work will the patient consult a physician. Imagine every woman's going to a physician because her back hurts! I am not sure that the average physician would welcome such a practice. The symptom itself is so indefinite that it is of value in the diagnosis of renal cancer only when associated with hematuria. Of course, many times pain is due to a large tumor.

The fourth factor that tends to increase the ultimate morbidity is failure to do a radical operation when circumstances permit. A radical disease such as this requires radical treatment. Just how much this would increase the percentage of operative cures above the 10 to 25 per cent recorded in the literature is doubtful. It might, however, reduce the number of postoperative recurrences. The term "radical" is of necessity all-inclusive. There are some procedures that can be easily accomplished, and others that are not so easy.

Removal of all the perirenal fat can and should always be done. A large percentage of parenchymatous tumors when operated upon already extend beyond the true anatomic capsule into the perirenal fat. Statistics on this point are hazy, but this percentage may well be far greater than we suppose. In this series, extension beyond the renal capsule was present in a large percentage of cases.

The advisability of doing a nephroureterectomy, with or without a segmental resection of the bladder, in papillary tumors of the renal pelvis is unquestionable, but it is not always feasible, nor is it advocated by all urologists. Nicolich feels that in most cases of tumor of the renal pelvis, whether of benign or malignant histologic structure, a nephroureterectomy should be done. However, since this radical procedure increases the operative risk, it should be done only when the general condition of the patient allows it. In old and weak patients one should do a simple nephrectomy, as a permanent cure is often possible. The nephroureterectomy may be done in one stage or in two (Smith and Gilbert).

It is true that not all cases of papillary tumor of the renal pelvis give transplants to the ureter and bladder, but it is equally true that no one can say offhand which papillary tumor will give rise to transplants and which will not. It is striking to see the percentage of recurrences of this tumor and the number of deaths definitely attributed to it, notwithstanding that clinically it is usually diagnosed early and that pathologically the growth is usually of low malignancy. Stricker in 175 cases of papillomatous tumor of the renal pelvis found transplants to the ureter and bladder in 47 per cent. In the cases where nephrectomy alone was done, 35 per cent had recurrence in the bladder or ureter. Kimball and Ferris reported 74 cases found in the literature, in 50 of which the tumors recurred in the ureter and bladder following nephrectomy. In 24 cases of their series, the ureter or bladder was affected at the time of examination or operation. Cabot and Allen report 33 cases of papillary tumor, in 20 cases (44 per cent) it was localized to the pelvis, and in 13 cases (29 per cent) the ureter and bladder had implants.

The benignity of the tumor is not necessarily a guarantee of cure (Smith and Gilbert), for not infrequently malignant metastases from such tumors have been found. The transplants may become evident at an early or late period following nephrectomy, this naturally necessitates keeping the patient under strict surveillance. Asch removed a small papilloma of the renal pelvis which was followed in two months by a secondary deposit in the bladder about 7 cm. in diameter. The blad-

der was resected and six weeks later the patient died. Extension to the scar was found. Zuckerlandl reports a case where six months following nephrectomy twenty tumors from 1 to 2 cm in diameter were found in the bladder. The bladder was negative at the first examination. Nitch had to do a total cystectomy owing to extensive papillomatosis of the bladder and ureter following removal of a papillary tumor of the renal pelvis. Necker cites a case in which subsequent to a nephrectomy the bladder became filled with papillomatous masses, whereas six months before it had been free of growth.

Two cases in our series are typical examples. One was that of a man of fifty-one who entered complaining of hematuria of eighteen months' duration, a diagnosis of papillary tumor of the renal pelvis was made. A nephroureterectomy was decided upon, but only a nephrectomy and partial ureterectomy was done, owing to the patient's condition on the operating table. He had an uneventful convalescence. A ureterogram and cystoscopy at the time of operation were negative. Fourteen months later the patient returned with a small tumor at the ureterovesical orifice. A complete ureterectomy and segmental resection was done, and up to the present time (five years) there are no demonstrable vesical recurrences. In the second case transplants appeared promptly. A nephrectomy was done for papillary carcinoma of the renal pelvis, and at the same operation part of the ureter was removed. At operation a cystoscopy and a ureterogram were negative. Four months postoperatively cystoscopy revealed a large tumor mass obstructing the ureteral orifice on the same side as the tumor. A ureterectomy and partial segmental resection of the bladder were done, the ureter was filled with small papillary implants. These two cases can be duplicated in any large series in the literature. They simply go to prove that it is impossible to tell before operation, even with a negative ureterogram and nothing at cystoscopy, whether very small transplants are present in the ureter or will be present in the bladder at a later date.

Other radical procedures, such as removal of solitary metastases when found in bone and deliberate opening of the vena cava to remove tumor plugs, have been advocated. The number of patients who fall into these two groups is indeed small, hence radical procedure of this sort would do little to raise the number of cures. Berg in 1913 called attention to the fact that "the metastases of hypernephroma are very often single," and added that "whereas with other varieties of malignant tumor one would decline to remove either the primary or secondary tumor because the metastatic

foci of disease are apt to be multiple, yet in this variety of growth we would be justified in extirpating both the primary tumor and the secondary deposit."

It is not a simple problem to say when a metastatic nodule is a solitary one and when it is not, but I believe one is justified in assuming that it is if a thorough x-ray examination of the rest of the bony skeleton and lungs is negative. Some of these cases of course have metastases in deep viscera not visualized by x-ray. That single osseous metastases do occur is proved by autopsy material. Lehmann collected in the literature 56 cases of bony metastasis from carcinoma of the kidney and found that in 13 of them the lesion was a solitary one. Five of these 13 were proved by necropsy, and in 8 the clinical examination revealed no secondary deposits. Hartmann cited a case of a man with a renal neoplasm and metastases to the humerus. The patient refused operation and later died. At necropsy no other metastatic nodule was found. Schinz and Uehlinger report solitary osseous metastases in 6 of their 34 cases. Smith and Shoemaker add the case of a male patient on whom a shoulder-girdle amputation was done, who had only a solitary lesion in the humerus. He refused a nephrectomy and died five years later. At the time of operation the lesion in the humerus was the only skeletal one present. Albrecht cites a case in which amputation was done for a supposed osteosarcoma, it proved to be a metastatic hypernephroma. The patient lived for five years, and at necropsy no other metastases were found. Many other cases of solitary bone metastases may be mentioned (Tixier, Bland-Sutton, Colmers, Geschickter, Broster, McKechnie, Bull, Pleschner), but considering the total number of reported cases of kidney cancer, they constitute a very small percentage of the whole.

Recently at this hospital, Dr. Churchill removed a pulmonary metastasis arising from a carcinoma of the kidney. So far as known, this is the first case of a successful lobectomy for such a purpose. The patient, a woman of about fifty, consulted a physician because of a persistent cough. X-ray of the chest revealed a metastatic nodule about 4 cm in diameter. Abdominal palpation showed the presence of a tumor mass in the right upper quadrant. X-ray photographs of every bone in the body revealed no bony metastases. I helped Dr. Barney remove the kidney. At operation there was no evidence of extension to the renal vein or vena cava. The perirenal tissue was not invaded by the neoplasm. Following the operation the chest was irradiated, without effect. Another series of deep roentgen treatments of the chest did little to decrease the size of the metastatic focus. Six months

after nephrectomy Dr Churchill did a lobectomy, four years have passed since then, and the patient is now in good health and to the best of our knowledge free of metastases. This case is cited as an incentive to others to remove solitary metastases.

Whether one should open the vena cava and remove the tumor plugs we cannot state, owing to lack of experience. In not a single case in this series was this done. That it is technically possible has been proved beyond question (Mayo), but whether the procedure decreases morbidity to a marked extent is doubtful. It is a fact that there are recorded in the literature many cases in which at nephrectomy tumor plugs filled the renal vein and vena cava, and yet the patients lived for years. Ljunggren cites a nephrectomy case in which at operation tumor tissue was noted in the renal vein and vena cava. Ljunggren examined the thrombus in that portion of the renal vein removed with the tumor and found that it consisted of hypernephromatous tissue. The patient lived for ten years and then died of metastases.

Allemann and Bayer, Judd and Hand, and Smith and Shoemaker record similar instances. The case cited by Smith and Shoemaker is interesting. The patient had a nephrectomy done for hypernephroma in 1913. At operation extensions to the spermatic and renal veins were noted. The patient lived for ten years and died of "cardio-renal disease." It has often been shown at necropsy that although the renal vein and vena cava were occluded with tumor, no signs of metastasis could be found (Rehn). This is a valid argument in favor of deliberate opening of the vena cava in some cases, but one should not forget that it may be extremely difficult to ascertain at operation just how much tumor thrombosis of the vena cava exists. The tumor plugs may extend to the right auricle (Quinland, Pleasants, Crowdy, Fraser, Jacobson and Goodpasture, Israel, Hinman, Albarán and Imbert, Osler, Lebert, Coyne and Troisier, Polayes and Taft, Carson, Oberndorfer and Rubbert, MacCallum, Taylor, Foster and Gerhard, Gayet and Bérinel), or down to the bifurcation of the iliacs (Crowdy, Jacobson and Goodpasture). This most radical procedure necessitates a transperitoneal approach, one which is advocated by all competent urologists for parenchymatous tumors of the kidney and which allows a greater exposure of the operative field than is possible with a conservative operation. There are, however, many renal tumors that can be easily removed by the usual retroperitoneal approach.

The value of deep x-ray therapy in the treatment of renal cancer is at present doubtful. From the maze of literature on the subject a few facts have been brought to light. They should be kept constantly in mind in applying this form of therapy to

such pathologic processes. So far as I am aware, no patient with a renal neoplasm, regardless of the histopathology, has been cured with deep roentgen-ray treatment alone. This has been enunciated by Mintz, Wharton, Harrah, Portmann, Dean and Pack, Priestley and Broders, Waters, Pohle and Ritchie, Prather and Crabtree and Schippers et al. In the 12 cases of Wilms's tumor reported by Priestley and Broders and in the 3 cases (malignant cystadenomas) reported by Geschickter and Widenhorn, in which irradiation alone was used, all the patients died. Perhaps when the roentgenologist is able to deliver a dose to the tumor at a greater depth without too much harm to the neighboring structures and too great a systemic effect, or, as Dean and Pack imply, when there is better equipment, a new era in its application will open. Until then no curative effect should be expected from irradiation alone. Preoperative irradiation of renal cancer has recently been extolled by many prominent urologists and roentgenologists. Its chief purpose is to shrink any large new growth, mainly Wilms's tumors and adenocarcinomas, so that an inoperable neoplasm can be made operable and be entirely removed. It has been demonstrated that after preoperative irradiation the extirpated tumors show, microscopically, strands and nests of vital tumor cells surrounded by areas of fibrosis of more or less density (Randall, Wharton, Dean and Pack). Necrosis of the tumor, varying with the amount of irradiation, takes place.

Wharton feels that failure to cure malignant tumors of the kidney is due to inability to remove completely the local growth. This inability he ascribes to a number of conditions: the pronounced size of the tumor, the thinness of the capsule, the extreme vascularity and friability of the mass, invasion of the perirenal structures and the extension into the renal vein. "The one factor," he continues, "which has been responsible for more operative deaths than all the others combined, the size of the tumor, has remained beyond control until the present time." There is no question that deep roentgen-ray treatment decreases the size of a renal neoplasm. It is extremely efficacious in Wilms's tumors, moderately so in adenocarcinomas and hypernephromas, and almost nil in tumors arising from the renal pelvis. As Wharton states, "the effect that preoperative irradiation has on the chance of ultimate cure cannot be reported, as this can only be determined with the passing years." Since Wharton's article, enough cases having preoperative irradiation for Wilms's tumor have been reported to give the clinicians some idea of what may be expected. It has not so far been successful as a curative agent when used in conjunction with late operative removal.

of the tumor, but the fact that it is still in its infancy is no bar to its continuance

Postoperative irradiation of the local area after nephrectomy is of questionable value. It is usually carried out in all clinics in cases where the tumor mass has not been completely removed, and in some clinics as a routine measure. All authors are not in accord as to whether postoperative irradiation should be given where a thorough removal of both the growth and the fatty contents of the renal fossa has been effected. Exactly how helpful it is as a curative or retardive measure in any single case is hard to judge. Whether some operated cases have been cured by this adjunct is extremely difficult to ascertain. I believe this form of therapy to be of very little value in cases where a thorough job of removal has been done. Delayed postoperative irradiation is usually confined to cases where recurrence has taken place in the kidney bed, in the scar or at distant points. Once there has been recurrence in the renal fossa, regardless of the pathological type of tumor, little can be expected from irradiation except a slight decrease in the size of the mass. It often happens that the recurrence is less radiosensitive than the original tumor, so that subsequent irradiation is not beneficial. A recurrence of a tumor nodule frequently takes place in the old nephrectomy scar, even years after the nephrectomy. Tikhoff cites an elapsed period of ten years, Bland-Sutton, eleven, Smith, seven, Graves and Mabrey, twenty, Bull, seventeen, Quinby, nine, Michaelsson, ten, and Muir and Goldsmith, fifteen. Irradiation here may be of some aid, but most urologists hold that the secondary deposit should, if possible, be removed surgically. Interstitial irradiation is sometimes useful for this type of recurrence provided the metastatic nodule is small.

It may not be amiss at the present time to state that our ideas about the value of x-ray therapy as an adjunct in the cure of renal cancer may change overnight, so to speak, with the newer developments in technic, dosage and high-voltage treatment.

From the maze of statistics of which this communication is a very minor part, I have formed a definite opinion as to why the percentage of five-year cures in this disease is so small. Although failure to do radical surgery in suitable cases is an element in reducing the number of late cures, the very nature of the disease is by far the largest single factor making for a high mortality. It is obvious that we see proportionately few cases of early pathologic lesions. We may see them early clinically, but pathologically they have probably either invaded the venous system or extended be-

yond the confines of the renal parenchyma. Unquestionably the end results would be much better in patients with renal cancer if they were treated soon after their first hematuria. Only persistent education of the laity as to the significance of urinary bleeding will add to the longevity in this group. But how about those who have had no hematuria, and whose first sign of renal cancer is to be found outside the urinary tract? This group is not by any means small, and its members are the victims of the well-known insidiousness of renal cancer. Their situation is analogous to that of patients with cancer in other deeply situated organs. The results will be greatly improved when the diagnosis can be made in this asymptomatic period while the growth is still limited to the kidney. Until that time we should not expect the impossible.

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DOCTORS AND BOOKS

PAUL D. WHITE, M.D. *

BOSTON

IT IS an honor to be asked to address you on the occasion of the inauguration of the Gerrish Memorial Library and Lectureship. We live in a land and in a time of opportunities that we appreciate all too little. I would begin, therefore, with a note of gratitude and a hope that we may deserve and cherish the privileges accorded to the medical profession in our country.

To speak of the value of a medical library is trite indeed, for everyone is aware of it. Many are familiar with Osler's saying in 1901 that "to study the phenomena of disease without books is to sail an uncharted sea." Oliver Wendell Holmes in his dedicatory address at the opening of the Boston Medical Library in 1878 said "A physician of common sense without erudition is better than a learned one without common sense, but the thorough master of his profession must have learning added to his natural gifts." And Harvey Cushing in 1926 wrote "As the calorimeter tells the activity of the patient's metabolism, so may you determine the plus or minus activity of the local profession in any district by the condition of its library." But there are still other things about doctors and books that are, I believe, worth saying. It is of some of these that I shall speak.

The first half of my address will be concerned with the importance of the record of ideas and facts, with the unimportance of priority and with the interesting subject of rediscovery.

Those who read medical books or journals often appreciate that what they read is what has been in their own thoughts in whole or in part for a long time, as the result of reflection, experience or research. They may react with pleasure that others agree with them, or with envy that they themselves had not had the time or inclination or industry to do the writing first, or with annoyance because of what they believe to be errors or omissions. Actually it is vain and idle to boast or to quarrel about priority. Always men have lived in periods where others besides themselves have been at work on the same problem, no matter how unusual or bizarre. I myself remember being surprised some years ago, when I was dissecting a whale's heart, on being told that someone in Norway was doing the same thing at that very time.

The larger and more important the problem, the greater as a rule is the number of solutions of that problem. Many contributions have been made toward its solution by many different individuals, sometimes the same discoveries being made simultaneously and entirely independently by different workers. Then, when the pieces of the puzzle are almost assembled, some inspiration or clue may suddenly complete the picture, and the lucky person may receive more than his due of credit. After all, it may be that the first step in the analysis of the problem, often in history, was more vital than the last. No contributor deserves credit, and the more we know of medical history the more we find this to be true, new or forgotten names take rank with those that have long been well known—for example, the Flemish artist van Calcar, pupil of Titian, who drew the splendid anatomical pictures for Vesalius. Even the great Harvey but for the masterpiece of the discovery of the circulation of the blood which had long been building up himself studied in northern Italy under anatomists who had learned from their forerunners and their own observations that there was a pump sending blood from the right ventricle through the lungs to the left ventricle, receiving thereby a vital spirit which the left ventricle pumped on to the tissues of the body, that the blood in the veins carried nutriment back to the heart, that there were doubtless capillaries—too small to see—connecting arteries with veins, and that the veins contained valves. Harvey noted that the valves in the veins were so constructed that they prevented (not simply retarded) the retrograde flow of blood through the veins. This was the clue that he seized upon, by simple, clear experiments he demonstrated that the blood flows from left to right ventricle through the systemic arteries and veins to complete the circulation already in part understood in the pulmonary circulation. But even he could not complete the picture. He too assumed that there must be capillaries, but it remained for Malpighi several decades later to discover them.

I have presented this instance because Harvey's discovery is generally regarded as the highest landmark in the development of our knowledge of medical science. Yet it is clear that great as was his work, it was but one contribution among many in the same field, had not Harvey made the

The Gerrish Memorial Lecture, read at the Central Maine General Hospital, Lewiston, Maine, May 26, 1937.

Physician, Massachusetts General Hospital. Lecturer on medicine, Harvard Medical School.

covery, it is well nigh certain that someone else would have made it within a relatively few years, for the time was ripe. Roesler, formerly of Vienna and now of Philadelphia, has recently most aptly quoted Sir Michael Foster

To whom shall be given the honor of a discovery. This question can never be answered fully, science is a continuous process, each investigator must of necessity build on the work of those who come before him. What we know and what we think is a stream which flows by us and through us, fed by the far-off rivulets of long ago.

Harvey himself in 1628, in Chapter I of the *De Motu Cordis*, in speaking of this very subject quoted the old man in the comedy *Adelphi* by Terence

For never yet hath anyone attained
To such perfection, but that time, and place,
And use, have brought addition to his knowledge
Or made correction, or admonished him,
That he was ignorant of much which he
Had thought he knew, or led him to reject
What he had once esteemed of highest price.

Incidentally it is of interest that the priority of the announcement of knowledge of the pulmonary circulation in the century before Harvey is still in doubt, an academic point and yet one historically intriguing. Realdus Columbus, professor of anatomy in Northern Italy, published his *De Re Anatomica* in 1559, and in that volume is the description of the pulmonary circulation. Six years earlier, however, the circulation of blood through the lungs was referred to incidentally in the religious tract *Restitutio Christianismi* by Servetus, who was that same year burned at the stake for his religious views. And much earlier still, in the thirteenth century, the theory of pulmonary circulation was advanced quite clearly by Ibn-an-Nafis (Haddad and Khairallah*). It may be that still earlier mention was made in manuscripts now lost. It was a time, of course, when verbal instruction and knowledge was the rule because of the expense and difficulty of writing and of printing. It is probable that Columbus and others had taught the pulmonary circulation for years before the appearance of *De Re Anatomica*. As it stands now, however, Ibn-an-Nafis holds the priority of announcement.

One other example I would cite in emphasizing this point, an example nearer home and in our own times. In 1914 Dr. Richard C. Cabot wrote an important paper on the causes of heart disease, a landmark in the study of diseases of the circulation. It was simple and clear, as are most significant contributions in medical science. He did not think it was a masterpiece or that he was the only man in the world with such thoughts, but he recognized that many workers and writers in medicine were not aware of the importance of

these findings. And so he wrote them down. A few days ago one of Cabot's contemporaries told me that what he wrote in 1914 was common knowledge at the time, and implied that little credit should be given to the contribution. It is true that others had the same ideas, but they did not realize that thoughts in order to live, or even to travel far from their immediate neighborhood, must be recorded.

That is the first important message of my talk to you today. It is, in sum, that if a doctor has learned something from his experience in practice or in research that is not clearly or widely known, and is not recorded in print at all or as he believes it should be, it is his duty to write briefly and clearly his findings. Such a duty may become a pleasure, but it goes without saying that the doctor must make sure, first, of the truth of his conclusions, secondly, of their importance, and thirdly, that they are not already on record. Thus any of us may be writers of books or articles as well as readers of books, if we keep our eyes open, and have enough curiosity and opportunities, judgment and persistence. We certainly have more than enough so-called medical literature now, but there is still plenty of room for worth-while books and articles.

The next message I would give you naturally evolves from the first. Do not fill your library full of modern books and journals; leave plenty of space and money for the more important books of the past, dating back if possible to the time of the first printing presses. It is not essential that you shall have any priceless incunabula, that is, books printed before 1500, but it is important that you secure some representative volumes of the sixteenth, seventeenth, eighteenth and nineteenth centuries, even though a considerable proportion of them will be in Latin, German, French or Italian. There is always someone in every community who can help you in the translation of these languages when you are looking up some special points of interest. A classic or a leading textbook of the past is far more valuable than a second-rate volume of the present, in a practical sense as well as from the standpoint of the book-collector. Although many important medical books and articles are being published today, much of the enormous mass of writing is not worth the paper it is written on. Only a small percentage of books and journals is necessary to have close at hand for ready reference, it is always possible to go or to send to Washington or New York or Boston or elsewhere for the rarer or less important works. The committee that will have the selection of your books must be very wise, its judgment will be more important than the size of the budget for the purchase of books.

*Haddad, S. I. and Khairallah, A. A. Forgotten chapter in history of circulation of blood. *Ann. Surg.* 1941, 153: 1024.

DOCTORS AND BOOKS

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Physician, Massachusetts General Hospital; Lecturer on medicine, Harvard Medical School.

in such exaggerated measure that their pupils, who were our own teachers, discovered their error and then swung too far in the opposite direction.

Anyone who finds it difficult to think of new problems to puzzle over need only review some of those mentioned in former days and then forgotten. Indeed, if he goes back in the literature two or three generations he may come across some clever notion or suggestion to follow up on, if he is unprincipled enough, to assume as his own. The great Corvisart, physician to Napoleon, in the preface to his translation of Auenbrugger in 1808 said that for all the current medical world knew of Auenbrugger's important discovery of the use of percussion in clinical diagnosis forty-seven years earlier, he (Corvisart) could easily have announced it as his own.

Oliver Wendell Holmes, in his address in 1878, referred to the need of a collection of the works of the old masters for every medical library. "Men were not all cowards before Agamemnon," he remarked, "or all fools before the days of Virchow and Billroth." He added

It does please me to read the first descriptions of parts to which the names of their discoverers or those who have first described them have become so joined that not even modern science can part them to listen to the talk of my old volume as Willis describes his circle and Fallopius his aqueduct. We need in this country not only the scholar but the *virtuoso* who hoards the treasures which he loves.

To hammer this thought home I conclude this first part of my address with two brief quotations from Osler's 1901 address at the dedication of the new building of the Boston Medical Library.

There is a third class of men in the profession to whom books are dearer than to teachers or practitioners—a small, a silent band, but in reality the leaven of the whole lump. The profane call them bibliomaniacs.

I should like to see in each library a select company of the Immortals set apart for special adoration.

Finally, as Lowell remarks,

'Tis man's worst deed
To let the things that have been run to waste
And in the unmeaning Present sink the Past.

* * *

The latter part of my address has to do with a subject of equal interest to that covered by the first. It concerns medicine as literature and literature as medicine.

It is indeed a pity that this golden age of medicine does not coincide with the golden age of literature. Many important facts and ideas are buried, or at least in part concealed, by verbose or clumsy or otherwise inferior writing. In this matter the early education and environment of the doctor are often at fault. Not only has much of the fundamental cultural training of the youth been neglected, but even the rudiments of penmanship,

spelling, grammar and literary style are often too hastily covered to establish good habits in the student of the present generation. It has become almost a commonplace that the average doctor writes illegibly, spells atrociously, constructs barbaric sentences and paragraphs and has an uncouth literary style. Since it is impossible to tell in childhood who will be the writers of medicine in the next generation, it would be wise to require of applicants for admission to the medical schools in the future a truly classical as well as a scientific fundamental education. The inclusion of Greek and Latin in language and literature, French and German, English in all its aspects, and history and archaeology in the pre-medical curriculum might easily make the difference between enjoyment and profit on the one hand and disappointment and neglect on the other, both in the reading and in the writing of important medical scientific papers and treatises. More and more we shall realize the truth of this, and shall strive to emerge from the barbarism of the medical literature of today to a higher level.

As I have already indicated, this situation has a practical as well as an esthetic bearing upon medicine. What is well written is much more likely to be read and believed than what is clumsily or dryly written. Many untruths and exaggerations in medical or other sciences have been so attractively presented in writing that they have been widely read and have vied with pure fiction among the best-sellers, while many facts and theories of the greatest importance are still buried in verbose, dull or unintelligible language in book or journal. Now and then there shines forth an exception in which a valuable discovery or thought is couched in such excellent style that it attracts early and lasting attention. These gems in books or reprints you should zealously seek and jealously save, no matter how ancient or modern, how long or brief, or in what language.

A few of the literary treasures in medicine are the *De Medicina* of Celsus of Rome—a finer piece of concise writing than the books of Galen which followed, the medical translations of Linacre, the *De Motu Cordis* of William Harvey, a clear, forceful and entertaining treatise as well as the announcement of a great discovery, the *De Aneurysmatibus* of Lancisi, physician of that very intelligent pope, Clement XI, one hundred years later, the *Opera* of Sydenham of 1666, the volumes on heart disease by Senac and Corvisart, physicians of the French Court in 1749 and 1806 respectively, the *De Sedibus et Causis Morborum* of Morgagni in 1761, the writings of Heberden and Withering at the end of the eighteenth century, the notable treasure on the heart by James Hope of London in 1832, Trousseau's *Lectures* of 1861,

We must be constantly on the watch for the announcements and descriptions of new discoveries and advances in the active medical progress of today, but we must also have a thought for the rediscoveries. The rediscovery of a fact or truth or the restatement of an important theory or teaching is almost as significant as its original presentation, but it is much more satisfying and less humiliating for the rediscoverer to know by careful historical research that he is a rediscoverer than for him to assume at the start that he is the originator. Medical history is full of rediscoveries. It may interest you if I cite but a few that have come in my own particular field, namely that of cardiovascular disease.

Lancisi, physician to Pope Clement XI at the beginning of the eighteenth century, described the engorgement and pulsation of the jugular veins that accompany enlargement and failure of the right ventricle, in fact, this phenomenon was for many years known as Lancisi's sign. It appears to have then been forgotten, two hundred years later it was rediscovered by James Mackenzie and his pupils, who apparently knew little or nothing of Lancisi's observations.

In 1832 Hope in England described clearly the congestion of the blood vessels of the lungs, along with the consequent dyspnea that results from failure of the left ventricle. This vital phenomenon was later almost completely neglected in English medical writings, and was even denied by Mackenzie and his school. It has now been rediscovered by writers of the English language, although one conversant with and sympathetic to French and German medical writings, at least in the last generation, would not have fallen into this error.

In 1715 Vieussens of Montpellier described the pulmonary stasis that results from the mechanical effect of mitral stenosis. Yet even in our own day there are many who fail to recognize this, and who do not realize that the dyspnea in uncomplicated marked mitral stenosis, whether in paroxysmal form with or without cardiac asthma, or in chronic form as the result of effort, excitement or infection, is not due to failure of either the left ventricle or the right, but to the overloading of the already congested pulmonary blood vessels by the increased rate of the over-strong right ventricle.

In 1749 Senac, physician to the French Court, wrote that he had often found quinine helpful in cases of rebellious palpitation. In 1914 Wenckebach reported that a patient of his had rediscovered this interesting fact. Now, in the form of quinine, cinchona bark is frequently used in patients

with paroxysmal tachycardia, auricular fibrillation and premature beats.

In 1785 Withering wrote that powdered digitalis leaves should be administered at the outset in the dose of from one to three grains twice a day, bearing in mind that thirty grains may be taken before nausea begins. In our own generation we rediscovered this optimal dosage. We knew, of course, that Withering had introduced the foxglove for dropsy, but most of us did not read far enough along in his remarkable book to get to the page where he gave advice as to the exact dose.

Bonetus, who as far back as 1679, compiled huge volumes of autopsy case reports, arranged according to symptoms from the top of the head to the soles of the feet, was one of the early forerunners of Cabot in differential-diagnosis case teaching. In these volumes, still largely untranslated, many interesting conditions can be read about, such as sudden death in a robust middle-aged man with aortic stenosis, a phenomenon that has again in recent years aroused special interest. Morgagni nearly a century later did of course present again many of the cases cited in the *Sepulchretum* of Bonetus, with valuable commentaries on their pathological significance, but there are still gems in this mine that may be rediscovered.

Osler, in the original edition of his *Practice of Medicine* of forty-five years ago, pronounced some views that we now think are rather newly held. For example, under rheumatic fever he writes that chorea is more apt to develop in the relatively slight rheumatic attacks of childhood, that rheumatic nodules may be regarded as a positive indication of rheumatism and have been noted particularly in severe and chronic rheumatic endocarditis, and that "medicines have little or no control over the duration or course of the disease, which like other self-limited affections practically takes its own time to disappear. Salicyl compounds, which were regarded so long as specific in the disease, are now known to act chiefly by relieving pain. Nor do they prevent the occurrence of cardiac complications."

And so it goes. The more one reads the better medical works of past generations, the more astonished one becomes, and the more humble, too, at what has been known and written and then forgotten. Progress has, after all, been very gradual with its ups and downs, though latterly much accelerated by the energetic activity of many workers. Yet in our zeal and enthusiasm at the present day we must not overlook the work and the ideas of our predecessors. We may perhaps rightly overthrow some of the teachings of our own teachers, only to find that their teachers in turn had believed some of the things that we believe today, perhaps

Conan Doyle, and the essays of Osler, Cabot and Cushing

The patient's reading must not be forced. The first rule is that it be for pleasure, and the physician can even profitably express to his patient his envy of the leisurely opportunity for reading that will come in convalescence or in prolonged illness—an opportunity that some over-busy physicians secretly look forward to, if only they may select their own illnesses!

And now, in closing, I wish long life and great usefulness to the Gerrish Memorial Library in its service to the doctors in Maine. May its books and journals play their part in keeping the medical profession in this State abreast of the times. May the library help in bringing solace and pleasure to both patients and doctors, and even kindle some susceptible spirits to add their own contributions to literature as well as to medicine.

GRANULOCYTOPENIA

Report of a Case with Autopsy

CHRISTOPHER C. SHAW, M.D.*

BELLOWS FALLS, VERMONT

GRANULOCYTOPENIA is characterized by a marked reduction in the number of circulating white blood cells, especially the polymorphonuclear leukocytes, with resultant impairment of the defense mechanism of the body against infection. Subsequent invasion of the respiratory and gastrointestinal tracts by the resident bacterial flora produces ulceration and necrosis. The onset of this disease may be insidious, its course dramatic and the outcome rapidly fatal. A somewhat similar clinical picture may be seen in overwhelming sepsis with extreme reduction of the white blood cells. The treatment and prognosis of the two syndromes are the same. The following case is probably of the latter sort.

CASE REPORT

D. J., a 64-year-old female, was first seen on October 6, 1936, when she requested a series of prophylactic inoculations against the common cold. She stated that she had arthritis and "heart trouble," and that she had been hospitalized on several occasions during the previous year. No satisfactory progress had been made and she had consulted a physician in another community, who had advised her to have her teeth extracted. This was done during the spring of 1936, but the arthritic pain continued, and sometimes she noted a swelling of the ankles at the end of the day.

The patient refused a general physical examination, so that a satisfactory history was not obtained. She weighed 201 lb, the blood pressure was 170/96 and the pulse rate 100. The heart sounds were essentially normal, and there was only slight edema of the ankles. The patient was given a reduction diet and advised to report at weekly intervals for the desired inoculations.

On that day she was given 4 minims of a stock coryza vaccine subcutaneously without reaction. A week later the dose was increased to 6 minims, and on October 20, 6 minims were again administered. The blood pressure on October 20 was 160/86, and the weight was 197 lb. The urine was negative for albumin and sugar,

and microscopic examination of the sediment showed nothing remarkable.

Eight hours after the last inoculation with the vaccine the patient had a severe chill and was somewhat cyanotic. She was very apprehensive but complained of no pain. She was put to bed and given 10 minims of adrenalin to combat the chill and 1 gr. of phenobarbital to allay her apprehension. The following morning there was a slight elevation of the temperature and pain in the lumbar region. Examination of the urine revealed from 15 to 20 pus cells per high power field, with several small clumps of leukocytes and an occasional red blood cell in the sediment. On the basis of these findings a diagnosis of pyelitis was made and the patient was seen daily for the next 7 days. She responded well to bed rest and conservative measures, and was discharged as cured on October 27.

Five days later (November 1) I was called to see her in the middle of the night because of nervousness and general malaise. She said that she did not feel well and wanted to make sure that nothing was wrong. The physical findings were essentially normal and the patient did not appear ill. No blood count was done at that time.

On the morning of November 4 I found the patient slumped in her chair in an exhausted condition, complaining of sore throat. It was at once apparent that immediate hospitalization was imperative. On admission to the hospital the temperature was 102.4°F, the pulse rate 100 and the respirations 22. The white-blood-cell count was 8150, with 71 per cent neutrophils and 16 per cent small lymphocytes. The erythrocyte count was 4,000,000, and the hemoglobin 75 per cent. The patient was quite weak and complained of being chilly. The mouth was dry and the throat sore. Examination revealed several areas of shallow ulceration involving the mucous membrane of the posterior pharyngeal wall, tonsils and fauces. The lungs were clear, the heart normal, and the blood pressure 142/70. The remainder of the physical examination showed an essentially normal condition, except that the patient appeared unduly toxic. Throat smears and cultures were negative for diphtheria bacilli, but revealed many other organisms. She was given the usual routine treatment for tonsillitis and pharyngitis, but complained of progressive soreness in the throat and marked dysphagia. At 4 o'clock that afternoon the temperature had risen to 104°F, the pulse rate was 88 and the respirations were 28, but the white-cell count had dropped to 5400, with 40 per cent neutrophils and 50 per cent small lymphocytes.

*Presented at the annual meeting of the Vermont State Medical Society at Saint Johnsbury, Vermont, October 14, 1937.
Preceptor in medicine, University of Vermont Medical School, Burlington, Vermont.

Osler's *Practice of Medicine* of 1892, and Cushing's *Life of Osler*, published in 1925

A classical education, spurned by many of the scientists and professional workers of today, has other values than those of the writing of better books and of pleasure in their reading, it adds enormously to the enjoyment of life and to its richness with the passing of the years. Even Greek, which is now so little studied, not only eases the lot of the first-year medical student as he memorizes many new anatomical names, but affords a foundation of the study of the history of medicine which has a practical as well as an esthetic value. It also greatly increases the enjoyment and profit of a visit to the medical shrines of Greece, which I myself most heartily recommend to any physician, young or old.

There remains the neglected topic of literature as medicine. We are all conscious of the possible importance of this method of psychotherapy, but we apply it very little, allowing our patients to read an enormous amount of absolute trash. Some reading matter of this description may be permitted on the basis of its soporific or distracting quality, but most of it were better consigned to the fire and replaced by something really worth while which can continue to be enjoyed through a lifetime. The text of Dr Gerald Webb's delightful address delivered before the Association of American Physicians in 1930 is one of the very few writings on this interesting subject.

I advise you to reserve a shelf or two of your library for books which have an outstanding value in convalescent care and in the treatment of nervous prostration, mental depression, chronic invalidism and incurable disease. I do not refer so much to books especially written for patients as to classical literature that delights the mind, absorbs the attention, and cheers the spirit of the healthy as well as that of the sick. What books are especially adapted for this? Which ones may lead the patient to new interests as well as to help him to pass the time enjoyably? In our own New England flowering of one hundred years ago there were two authors whose books belong here: Thoreau and Emerson. There are also Holmes's *Breakfast Table* series and the works of Mark Twain. For the beginning of convalescence there may be read snatches from Burns or Kipling. Soon after, the mind may be completely transported by James Hilton's most delightful story *The Lost Horizon*, *John Brown's Body* by Stephen Vincent Benét, or *Memoirs of a Midget* by Walter de la

Mare. Still later, the novels of Conrad, Dickens, Victor Hugo or Charles Reade, Chesterton's "Father Brown" or Doyle's Sherlock Holmes series may be prescribed with telling effect, not to mention such biographies as Strachey's *Queen Victoria* and *Eminent Victorians*, the essays of Lamb and Irving and the poetry of Coleridge, Wordsworth, Shelley and Keats. For more robust minds, at the end of convalescence or in chronic illness, Ortega's *The Revolt of the Masses*, Gibbon's *Decline and Fall of the Roman Empire*, Prescott's *Conquest of Mexico*, Galsworthy's *Forsyte Saga*, *South Wind* by Norman Douglas, and the works of Browning and Shakespeare, for young persons Stevenson and *Robinson Crusoe*, Mark Twain, *Alice in Wonderland* and *Dr Dolittle's Voyages*. Always one must judge the strength, mental age and interests of his patients. Some of these will do well in late convalescence or chronic illness to indulge in essays and articles dealing with fundamental aspects of the arts and sciences, but it is well not to force such books too soon.

I refer you especially to four passages of sound literature as examples of what may be used to entertain, divert and instruct the mind during convalescence or chronic illness. The first two, by writers of the past, are three paragraphs from Emerson's essay on Shakespeare, written in 1850, beginning "Great men are more distinguished by range and extent than by originality," "So it fares with the wise Shakespeare and his book of life," and "Shakespeare is as much out of the category of eminent authors as he is out of the crowd," and the first few pages of Shakespeare's *Julius Caesar*. The latter two, by authors of our own generation, are the first four stanzas of Benét's *John Brown's Body*, and a bit from T. E. Lawrence's *The Seven Pillars of Wisdom*, at about the middle of the book, describing the comments of Nasir, Mohammed, Zaal and Auda on the stars.

Let the doctor eventually pick out a "five-foot shelf" of books for therapeutic use, and read them himself. To do so will add to the pleasure of his life, the cultivation of his mind, the easing of strain and the effectiveness of his treatment—goals which are infinitely worth while, even though the patients themselves do not receive the books until they have become shopworn at the doctor's bedside.

Finally, in this collection of literary medicine set aside for professional interest there should be a special group consisting of the worth-while books that doctors themselves have written: the romances of Gargantua and Pantagruel by Rabelais, the writings of Oliver Goldsmith and Thomas Browne, the works of Oliver Wendell Holmes and S. Weir Mitchell, the detective stories of

*I have not included among the works cited below certain passages from the Bible despite their important place in literature and beauty of thought for those already familiar with the Scriptures; however, and for others needing spiritual consolation there are many passages from both Old and New Testaments that may be recommended particularly from the Psalms and from Christ's sermons.

and by Schwartz, Garvin and Koletsky⁵ and Berg and Holtzman⁶ in this country.

It has now been definitely established by extensive animal experimentation that benzene, or a benzene compound, is the one drug which will consistently produce a profound depressant action on the myelopoietic system. Kracke and Parker⁷ have demonstrated that aminopyrine and its derivatives will break down on oxidation into a double benzene ring, and if this oxidation process is carried far enough it will yield a pyrazolon derivative similar to phenylhydrazine, which in turn produces an aplasia of both the red and the white blood cells of the bone marrow. Kracke and Parker have further postulated that aspirin and other drugs of this series do not break down into oxidation products and are therefore relatively nontoxic. They cite numerous cases of agranulocytosis following the ingestion of aminopyrine alone or in combination with other drugs, and publish a list of forty-six such compounds which have been condemned by the Council on Pharmacy and Chemistry of the American Medical Association. Unfortunately this list does not include numerous patent medicines and secret formula remedies which are advertised widely to the laity through the newspapers and magazines and over the radio. The aminopyrine content of these nostrums is not known, or at least is not divulged either to the practicing physician or to the public, and there is as yet no readily available method of determining the hypersensitivity of a patient to such compounds before administration of the drug.

The distribution of these proprietary remedies—aminopyrine and sulfanilamide—has become world-wide, and coincident with their popularity the disease agranulocytic angina has been reported with increasing frequency throughout the so-called civilized countries. It was first described in Germany in 1922 by Schultz⁸ and in the United States in 1924 by Lovett.⁹ Kupper¹⁰ found only two earlier reports in the literature suggestive of agranulocytic angina, those of Brown and of Türk. In 1902 Brown¹¹ reported a "Fatal Case of Acute Primary Infectious Pharyngitis with Extreme Leukopenia," and in 1907 Türk¹² presented an article on "Septic Disease with Atrophy of the Entire Granulocytic System."

During the past fifteen years there has been a deluge of case reports of agranulocytic angina. This disease occurs mainly in women of middle age, it has become especially prominent among the upper social classes, who apparently tend to consume large quantities of proprietary medicines containing aminopyrine or sulfanilamide, and unfortunately is found all too frequently in members of the medical and other professions.

The symptoms of agranulocytosis are due to sepsis resulting from a marked diminution or even total absence of granular leukocytes in the circulating blood. This results in a loss of cellular resistance and the advent of infectious processes of various types, often fulminating in character. Two clinical types of the disease have been described—the acute and the chronic. In the acute type, similar to the case reported herein, there is a sudden onset of malaise accompanied by sore throat and fever. The progress of the disease may be very rapid. The malaise develops into a toxemia, the elevation of temperature into a hyperpyrexia and the sore throat into ulceration, necrosis and gangrene of the mucous membranes of the respiratory, gastrointestinal and genitourinary tracts. In such cases death may ensue in from twenty-four to forty-eight hours after the onset of the symptoms, and the blood count reveals a rapidly progressive and malignant type of neutropenia.

In the chronic form the first symptoms noted are usually a feeling of malaise, weakness and mild prostration, accompanied by chills, headaches and pain in the joints. These may be followed in a few days by a slight scratchy feeling in the throat, and an elevation of the temperature by a degree or two. The most common complaint in such cases is fatigue and exhaustion and it may well be that many middle-aged women who complain of being tired are actually suffering from a low-grade granulocytopenia. If the condition becomes progressive some degree of secondary anemia may appear in the chronic cases. Nerve pain may develop and the patient may gradually lose weight. Symptoms of functional nerve disease often confuse the clinical picture. The sore throat becomes very recalcitrant to treatment and in due course of time ulcerations may appear on the tongue, tonsils, fauces and posterior pharyngeal wall with intractable halitosis. The patient's general condition appears alarming as cachexia or a blood-stream infection sets in.

Blood counts taken during the course of such a malady reveal a progressive leukopenia, with a marked diminution of the neutrophilic percentage. In the chronic form remissions and exacerbations are the rule, and many patients have survived previous mild attacks only to succumb to a subsequent acute relapse complicated by a blood-stream infection, terminal pneumonia or fatal hemorrhage. Occasionally meningitis develops or a multiple peripheral neuritis makes the patient's condition unbearable.

The diagnosis of granulocytopenia (agranulocytosis) is based on the interpretation of the differential blood counts, which must be made in order to differentiate primary agranulocytosis, aleukemic

On the basis of this progressive leukopenia and the presence of the pharyngeal ulceration, a diagnosis of granulocytopenia associated with overwhelming sepsis was established. An attempt was made to obtain Pentnucleotide for intramuscular injection, but none was available until the following morning. In the meantime there was marked progression of the toxemia, and it was thought best to administer a foreign protein in an attempt to produce a leukocytosis. Accordingly 5 cc. of Proteolac was administered intravenously, and this dose was repeated at 4 hour intervals intramuscularly. In addition 10 cc. of whole blood was injected into the buttocks that evening. There was little if any favorable reaction, however, and the following morning (November 5) the temperature was 105.6°F, the pulse rate was 92 and the respirations were 34. The white cell count had fallen to 560, with 17 per cent polymorphonuclear leukocytes and 80 per cent small lymphocytes. The nonprotein nitrogen was 41 mg per cent. The throat showed numerous ulcerations, spotted by a grayish membrane, which also covered the base of the tongue. The patient was unable to swallow food or saliva and drooled continuously. She was extremely toxic, and her condition appeared critical. She was therefore given intravenous glucose, saline by hypodermoclysis and a transfusion of 200 cc of citrated blood. Following these measures the temperature fell to 103.8°F, but early that afternoon there was a rise to 106°F with a pulse rate of 120.

In spite of the administration of 10 cc. of Pentnucleotide every 4 hours during the 2nd day in the hospital, the patient rapidly became moribund. At 5 o'clock on the afternoon of November 5 the white cell count was 750, with 17 per cent neutrophils and 82 per cent small lymphocytes. During the evening the patient developed pulmonary edema and auricular fibrillation, which could not be controlled by rapid digitalization. She went rapidly downhill and died at 3:38 a.m. on November 6, approximately 48 hours after the onset of symptoms.

An autopsy was performed 4 hours after death, an abstract of the protocol follows.

The body was that of a middle-aged white female. There was a moderate degree of rigor mortis and the skin was sallow. There was a scar of a previous surgical incision in the low midline of the abdomen. A small ecchymosis due to administration of medication was present on the right thigh. The adipose tissue appeared very soft and mushy.

The lungs were air-containing throughout, and there was no free fluid in either pleural cavity. Numerous fibrous adhesions were present at the pulmonary apices. The heart appeared essentially normal on gross examination. Atheromatous changes to a moderate degree were present at the root of the aorta. The mediastinal structures were essentially normal. The liver was especially large, but unfortunately there was no opportunity either to weigh or to measure this organ at the place where the autopsy was performed. The spleen presented an acute red tumefaction. The stomach, pancreas and intestines showed nothing unusual. The uterus showed senile atrophy, and both ovaries were absent, having been removed at a previous operation. The kidneys presented cloudy swelling and several old cysts in the cortex. The bone marrow of the femur was soft, pale and mushy, while the bone marrow of the rib was replaced by fatty tissue.

Examination of microscopic sections of the various organs confirmed the above findings of an aplasia of the bone marrow, acute splenic tumor, fatty infiltration of the liver and moderate arteriosclerosis. Sections of the bone marrow of the femur showed very little hematopoietic

tissue, and the blood forming islands that remained intact presented a majority of myeloblasts and myelocytes. Only one or two neutrophilic metamyelocytes were noted in the entire section, and no mature polymorphonuclear leukocytes were seen.

This case of granulocytopenia is reported in some detail because of its dramatic clinical course and because a postmortem examination was made. The pathologic lesions in this case were probably caused by sepsis, which produced the profound neutropenia or granulocytopenia that is typical of such a bone-marrow dyscrasia. In these cases, lymph-node and splenic enlargements are fairly common, while ulcerations of the buccal cavity and along the mucous membrane of the intestinal tract are quite characteristic. Jaundice and thrombosis of the small arterioles, accompanied by perivascular hemorrhages, are usually seen in sepsis. The complications are numerous and include such conditions as thrombophlebitis, septicemia and terminal hemorrhage, although the last-mentioned mode of exitus is rare. At necropsy, pneumonia of either the lobar or lobular type may be present, and toxic degenerative changes are commonly found in the brain, heart, liver, adrenals and kidneys.

The bone marrow at autopsy presents a primary hyperplasia of the stem cells of the myeloid series with an absence of the mature granulocytes. This is thought to be due to an arrest of the maturation of the granulocytes. The early cell forms of the myeloid series proliferate abundantly, but fail to reach maturity, probably owing to the inhibitory action of some toxic agent (overwhelming sepsis) or of some allergic action (drug idiosyncrasy) on the myeloid cells. Moreover, the inhibitive or toxic factor is selective, and confines its action to the immature myeloid cells, since the erythropoietic tissue of the marrow remains unharmed. Erythroblasts, megakaryocytes, blood platelets, lymphocytes and monocytes show no pathologic changes.

The chief etiologic agents which have been found responsible for initiating this arrest of the normal maturation of the polymorphonuclear leukocytes are aminopyrine, dinitrophenol, gold salts and organic arsenical compounds. However, there are numerous cases on record in which no history of ingestion or administration of these drugs can be obtained. It would appear, therefore, that the disease may develop in certain instances without any apparent cause. During the current year, Hench¹ has put on record a case of agranulocytosis which resulted from the administration of sulfanilamide, a popular benzene derivative, para-aminobenzene sulfonamide. More recently, fatal granulocytopenia from sulfanilamide has been reported by Borst,² Model³ and Young⁴ in England.

THE RELIEF OF PAIN IN CANCER

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IN CANCER the treatment of pain occupies an important place. The measures adopted, whether radiologic or surgical, radical or palliative, are often directed against both pain and disease. They are necessarily supplemented by the more or less widespread use of sedatives. In the majority of instances, even when cure has not been effected, the pain may thus be controlled. There are still, however, a considerable number of patients whose pain continues to be unrelieved in this manner. To this group, a variety of neurosurgical procedures can be applied with benefit, though this benefit may be only partial or temporary. As one's experience in dealing with such pain widens, the need of treatment becomes more obvious. One comes to feel also that treatment should be applied earlier in the disease, a short life expectancy is not necessarily a contraindication.

REFERRED PAIN

Some understanding of the mechanism of referred and radiating pain is essential for the accurate determination of its point of origin. This is true not only of lesions of the face, mouth, throat, head, neck and shoulder, which may be visible, but also and especially of the more deeply seated or concealed lesions in the viscera or parietes. Growths involving the anterior two thirds of the tongue and floor of the mouth may cause pain to be referred to the temporal region, the ear or the top of the head. Face and scalp pain follows the course of the auriculotemporal branch of the mandibular or third division of the fifth nerve. Ear pain may be referred along the tympanic branch of the glossopharyngeal nerve. With involvement of the upper alveolus, palate, antrum and upper part of the face, the pain may be local and be referred from the malar or zygomatic region part way around the orbit (zygomaticotemporal branch of the second division of the fifth cranial nerve). With disease of the posterior third of the tongue, fauces or pharynx, pain is commonly referred to the lower throat and ear, and may be aggravated by swallowing.

In disease of the cervical lymph nodes, if in the anterior triangle, the pain is local and may also be referred in front of or to the ear, if in the posterior triangle, the reference is to the posterior part of the neck and scalp.

SENSORY NERVE SUPPLY OF THE HEAD AND NECK

The sensory elements involved in head and neck pain are the trigeminal, or fifth, the glossopharyngeal, or ninth, and the vagus, or tenth cranial nerve, the upper five posterior cervical nerve roots, and, to an extent as yet undetermined, the sympathetic ganglia or plexuses.

The trigeminal nerve supplies sensation to most of the face as well as the scalp two thirds of the way back to the occiput, a portion of the outer upper part of the external ear, most of the tongue,—the anterior two thirds,—the floor of the mouth and palate, the eyeball and, with the aid of the sphenopalatine ganglion, the accessory air sinuses.

The glossopharyngeal nerve supplies, along with the vagus and sympathetics, the pharynx, the posterior third of the dorsum of the tongue, one half of the sides of the tongue, part of the soft palate, part of the faucial and tonsillar regions, the eustachian tube, the tympanic cavity, the inner surface of the eardrum and the mastoid cells.

The vagus nerve by its sensory connections is said to supply the skin of the posterior part of the auricle and the posteroinferior portion of the external auditory meatus, part of the external aspect of the eardrum, the pharynx in conjunction with the glossopharyngeal and the superior cervical sympathetic fibers, part of the base of the tongue, and the internal surface of the larynx (superior laryngeal nerve).

The upper five cervical posterior nerve roots supply, through the greater and lesser occipitals, the great auricular and lateral superficial cervical nerves, the skin and subcutaneous tissues of the lower part of the face, a considerable part of the external ear, the neck to below the clavicle in front, to the spine of the scapula behind, and externally to about the deltoid insertion, in addition to the posterior part of the scalp for one third the distance toward the forehead, meeting there the area supplied by the fifth nerve.

The salivary glands and the superficial and deep cervical lymph nodes receive their nerve supply from cranial, spinal and sympathetic nerves. The three large salivary glands are supplied by branches from the trigeminal nerve and from the cervical sympathetics.

NEUROSURGICAL MEASURES EMPLOYED

Broadly speaking, the neurosurgical measures employed to relieve pain comprise, in order of

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Neuro-surgical to State Cancer Hospital at Pondville

leukemia and aplastic anemia. If a history of administration of aminopyrine can be obtained, the problem of diagnosis is much easier, the age and sex of the patient should also be borne in mind. In short, the differential diagnosis of the leukopenic states requires great care in interpretation of the blood pictures and clinical findings in order to avoid misjudgment of the underlying lesions. It is obvious that not all cases of leukopenia are of the essential or primary type, nor are they related to granulocytopenia, malignant neutropenia or agranulocytosis.

The prognosis is poor in the acute type of the disease, in which the mortality in untreated cases averages between 75 and 85 per cent. In the chronic form the outlook is not good. Many cases may recover spontaneously upon withdrawal of the offending agent, only to develop a fatal recurrence at some future time. The appearance of eosinophils in the blood smear and a progressive increase in myeloblasts, neutrophilic myelocytes and neutrophils both point to a favorable prognosis.

Treatment of this disease resolves itself into four or five procedures. Pentnucleotide in sufficiently large doses—from 40 to 50 cc daily—acts almost as a specific in initiating bone-marrow activity in the primary leukopenias. Prompt improvement following the intramuscular administration of nucleic acid derivatives coincides with the myelocytic response, and in a sense parallels the reticulocyte response during recovery from pernicious anemia. Adenine sulfate, another nucleic derivative, may be given intramuscularly or intravenously with good effect. The parenteral administration of liver extract and transfusions of either whole or citrated blood may be of some value as a general systemic and hematopoietic tonic, but they are not specific for this disease. Gordon¹³ recommends injection of 40 cc of whole blood intramuscularly twice a day in order to produce an irritation of the muscle tissue and thus stimulate the bone marrow. Foreign proteins are useless. Intravenous dextrose and saline solution should be administered when the pharyngitis produces dysphagia and edema. Bland mouth washes and oral hygiene are indicated in the chronic forms of this disease. A high-nuclein diet, together with dietary components rich in vitamin G, has been recommended. It is obvious that supportive measures similar to those employed in any infectious process are indicated.

Unfortunately the therapy of granulocytopenia is far from satisfactory, and many of the patients with acute fulminating forms of the disease die regardless of the treatment employed. Nevertheless,

the judicious and adequate administration of Pentnucleotide both intravenously and intramuscularly has reduced the mortality from 80 per cent to approximately 25 per cent. Recovery seems to depend on early diagnosis and immediate and massive therapy. Not less than 40 cc of Pentnucleotide should be given in a day. The most logical form of treatment is prevention, and it is obvious that once the diagnosis is made no product containing aminopyrine or sulfanilamide should be administered.

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DISCUSSION

Dr. E. L. Amidon, Burlington, Vermont: Dr. Shaw has given us an excellent review of agranulocytosis. I cannot do better than add some data collected at the Mary Fletcher Hospital. His case differs from our cases in that his patient had sepsis, mouth lesions, a temperature of 102.4°F and a white-cell count of 8150 and 71 per cent neutrophils. In our experience the sepsis follows the leukopenia rather than the reverse.

All the cases of Vincent's angina, gingivitis, stomatitis, aleukemic leukemia and aplastic anemia received in the Mary Fletcher Hospital have been reviewed and checked. No case of agranulocytosis was seen prior to the year 1927. During the last ten years we have had 8 cases, 7 during the last four years. The first case terminating fatally was that of a physician, the blood smears at one time revealed no granulocytes. None of the physicians who saw this case had ever before observed such a state. All but 1 of our patients had taken an analgesic drug, or had had a history of some painful ailment which might have indicated such treatment.

Of the 8 patients with agranulocytosis, 6 received Pentnucleotide. Two died and 2 showed definite improvement in the blood before the drug was given, leaving only 2 in whose cases Pentnucleotide could have been helpful.

We have recently had a patient suffering from agranulocytosis following the administration of 1000 gr of sulfanilamide during a period of fifty days. The drug was removed, and he was given yellow bone marrow extract. His recovery was abrupt, and was complete in ten days.

Intracranial Operations

When the cancerous process is extensive, but involves only the branches of the fifth nerve, and if the patient's condition permits, intracranial section of the root of the fifth nerve is desirable. The section may be total, or may spare the ophthalmic division and motor root. Intracranial section of the third or the second branch, performed extradurally, is sometimes done also. The posterior root of the fifth nerve may be sectioned by either the temporal or the occipital (cerebellar) route. I prefer the former when it is feasible—that is, when it is not prevented by disease or infection in or near the operative field, and I believe it to be safer. If, however, the disease process and the pain caused by it involve adjoining areas which are supplied by both the fifth cranial and the upper cervical nerves, the cerebellar approach may be better, particularly if it is desired and is thought safe to combine a craniotomy with a laminectomy—that is, an intracranial and intraspinal section at the same operation. But this procedure cannot be tolerated in many instances of advanced cancer, such as we see at the Pondville Hospital, for example, although I have adopted it in a few cases.

Intracranial section of the ninth or glossopharyngeal nerve is sometimes done to relieve deep throat and ear pain due to cancer in the posterior tongue throat or pharynx. This operation is done by the cerebellar route, and is not difficult—considerably less so than that of division of the fifth nerve through this approach. This procedure is helpful but it does not always give complete relief, as we are probably also concerned in such cases with vagus and sympathetic nerves. It is ordinarily impracticable to section the ninth nerve in the neck. Rarely, in the presence of extensive disease, areas supplied by the fifth, ninth and upper cervical nerves may all be involved. In certain of these cases, intracranial section of the fifth and ninth nerves, combined with additional intraspinal section of the cervical nerves from the first to the fifth, inclusive, has been done at the same operation. I myself have not done this.

Intraspinal Operations

Cervical laminectomy and posterior-root section (rhizotomy) This operation is one that I have had many occasions to perform, I find it useful in the presence of disease in the neck giving rise to pain in the lower part of the face, neck and posterior scalp. A laminectomy—sometimes on only one side—extending from the first to the fourth cervical vertebra is performed. The first four or five posterior nerve roots on one side are then cut or crushed. The relief from neck pain is sat-

isfactory, and patients stand the operation fairly well.

Chordotomy The value of chordotomy, an operation first suggested by Spiller in 1911, was first fully demonstrated by the late Dr Charles H Frazier in 1920. It was at first used to relieve intractable pain below the upper part of the body. The operation was done at about the level of the fifth thoracic segment or the third dorsal vertebra. Since then it has been shown that in order to relieve deep pressure pain as well as superficial pain,—in the lower extremities, for example,—the operation must be carried as high as the third thoracic segment, that is, the first dorsal vertebra to include all pain fibers coming from the lower extremities. To relieve arm pain, the chordotomy should be done at the sixth cervical segment or the fifth cervical vertebra.

Chordotomy—section of the spinothalamic anterolateral columns—cuts across the pain-fiber tracts. The section is made on the side of the spinal cord opposite the limb or side of the body involved by pain. The pain fibers, after entering the spinal cord on its dorsal aspect in the posterior root, cross the commissure at once or within one or two segments to the opposite side of the cord and ascend in the anterolateral column of that side to the thalamus and thence to conscious levels of perception in the brain cortex. This column lies anterior to the pyramidal tract and the temperature fibers. To reach it, a fairly wide laminectomy is performed, preferably under local anesthesia, so as to be able to test immediately for a satisfactory level of analgesia. The dura is opened and the arachnoid incised laterally. A dentate ligament, which is a lateral prolongation of the arachnoid to the dura placed halfway between the anterior and posterior nerve roots, is cut at its dural attachment, and by traction upon it the cord is rotated so as to expose the anterolateral aspect on the side opposite the pain. A specially devised Frazier hook or a sharp-pointed knife blade is then inserted into the spinothalamic tract to a depth of from 3.5 to 5 mm just anterior to the attachment of the dentate ligament to the cord. The blade is brought from within outward and emerges at an anterior root. Immediate and complete relief from pain is obtained. This can be verified by testing for analgesia, both superficial and deep. If a bilateral chordotomy is done, there should be a difference of about a segment in the level of the sections in order to avoid interference with cord circulation. Chordotomy may be carried out as high as the second or third cervical segment if done unilaterally, but it is dangerous to do it bilaterally because of possible injury to phrenic centers in this region. A high and a low

frequency, (1) peripheral injection of branches of the trigeminal or fifth cranial nerve with alcohol, (2) intraspinal subarachnoid alcohol injection, (3) chordotomy, (4) spinal posterior-root section—rhizotomy, (5) intracranial cranial-nerve section—trigeminal and glossopharyngeal nerves, and (6) peripheral-nerve section—superficial cervical, inferior dental and lingual nerves. Other procedures less often used are alcohol injection of the Gasserian ganglion, myelotomy and presacral-nerve section.

As is evident, the attack centers more directly on the central and peripheral nervous system than on the autonomic, except in case of the presacral nerve. Autonomic nerve fibers involved in visceral pain, however, are sectioned in the operation of chordotomy at higher levels, and to a certain extent in spinal posterior-root section.

GENERAL PRINCIPLES OF RELIEF OF PAIN

With pain in the head, neck and shoulders, one deals with cranial or spinal nerves and their branches. The severance of these nerves involves the sacrifice of touch as well as pain sensation in a given area, but results in no hardship to the patient. An exception to the limits set in this field of activity may rarely be made in the case of bilateral intractable neck or shoulder pain, in which neither nerve roots nor peripheral nerves, but rather the spinal cord, either across the spinothalamic tracts—anterolateral columns (chordotomy)—or the commissure, might be divided (myelotomy).

To relieve upper extremity pain usually requires cutting pain-fiber tracts in the spinal cord (anterolateral columns). This operation interferes principally with pain transmission and to some extent with temperature appreciation, but leaves essentially intact those fibers mediating touch, pressure and position—an important consideration in the arms and hands. An upper extremity devoid of all modalities of sensation is practically useless. For this region, therefore, posterior-root section is undesirable.

This same method applies on the whole to similar problems below the upper extremities, that is, to those affecting the body—chest, abdomen and pelvis—and the lower extremities. In other words, relief of pain, unless due to disease which can be recognized as very limited in extent, is best obtained by rendering the entire body or one side of the body analgesic, from well above the uppermost level of pain, by a relatively limited operative procedure on the spinal cord. To be sure, resort to posterior-root section will occasionally be made, as for example in a localized lesion, often visible by x-ray as a bony metastasis, causing limited pain.

Unilateral or bilateral posterior-root section, however, is as a rule a more extensive operation and is less certain to give relief. Preference over chordotomy may also be given to spinal subarachnoid injection if the patient's condition is poor and life expectancy very short, provided the diseased area comes within the supply of the roots of the cauda equina. In any case, the necessity for preserving intact the sensation of touch and position in the lower extremities is clear.

SPECIFIC MEASURES AND THEIR REGIONAL APPLICATION

Peripheral-Nerve Injection with Alcohol

Peripheral-nerve alcohol injection is largely confined to the area supplied by the fifth cranial nerve. In elderly or debilitated patients this is often the only method available where the pain is due to implication of one or more—usually the second or third—branches of the fifth nerve. Moreover, some patients, having already undergone extensive operations or radiation, refuse further surgery. The results of such an injection are often satisfactory, more so, I believe, where the second division of the nerve is involved. Disease involving the third-division supply is prone to extend downward into the lymph nodes of the neck to areas supplied by the cervical nerves, or backward into ninth-nerve territory. For this reason, third-division alcohol injection may give but partial relief. Nevertheless, alcohol injection of the second and third divisions singly or together is commonly done, and is distinctly worth while. The extraoral method should be employed. The area supplied by the first division of the fifth nerve is infrequently involved by disease causing severe pain, and alcohol injection is seldom used there. It may be tried, but its results are not particularly satisfactory. Alcohol injection is not used in ninth or tenth cranial-nerve pain, or in that involving cervical nerves.

Peripheral-Nerve Section

Section of the fifth-nerve branches or the superficial cervical nerves has a certain limited field. The inferior dental nerve may be sectioned as it enters the dental canal in the lower jaw. The lingual nerve may be sectioned in the floor of the mouth. In lesions that are not too extensive both sections may be done.

The superficial cervical nerves may be sectioned as they emerge at the posterior border of the sternomastoid muscle. In this region one finds together, and may sever, an anterior, a descending and two ascending branches (great auricular and lesser occipital). This operation is applicable when the anterior neck triangle is involved, but not in the case of the posterior one, and is seldom done.

motor weakness, which may be transient or of long duration

In the higher lumbar injections there is subjective relief, and there may or may not be slight decrease in sensation in the lower extremities. If present, this is as a rule of brief duration. In the lower lumbar injections a hypesthesia or anesthesia of the saddle back type is frequently produced. It is relatively short-lived. The duration of relief varies. It may be days, a few weeks or longer, but ordinarily is sufficient for many of the well-advanced cases of cancer. Repeated injections are sometimes necessary. The interval between them should not be less than a week. If bilateral injections are done, it is well to limit somewhat the amount used each time. There is also some danger in elevating the hips too much, as the alcohol may extend to a level lower than desired, or may concentrate too strongly on the lowest roots, with resultant sphincter disturbance.

The length of time the patient's position should be maintained varies somewhat with different operators. Thirty minutes in the original position is about enough. It is generally felt that alcohol when given in small amounts shows some selectivity for the pain fibers in the nerve roots. These fibers are considered smaller and nonmyelinated, and thus more susceptible to alcohol. Beyond a certain point, sphincteric action as well as other forms of sensation and even motion may be affected.

Alcohol may be used above the cauda equina, and in some hands has been carried to the lower cervical level, but in such instances the procedure is fraught with a much greater degree of danger, owing to the proximity of the spinal cord and of the phrenic centers. The puncture is especially difficult above the lumbar region, and is not recommended except in isolated instances and in experienced hands. Multiple dorsal punctures with the injection of smaller amounts in each space have occasionally been used.

Further Procedures

The remaining procedures to be mentioned will not be given in detail. These are Gasserian-ganglion injection, myelotomy and presacral-nerve section.

Gasserian-ganglion injection has a limited field of usefulness, and carries with it the definite danger of injury.

The operation of *myelotomy* was introduced by Leriche in 1928, and independently by Dr Tracy J. Putnam, of Boston, for relief of high bilateral neck or shoulder pain. It is offered where high bilateral anterolateral-column chordotomy is contraindicated because of the danger of damage to the phrenic centers in the midcervical

cord. The occasion for its use is infrequent. In this operation, a narrow midline laminectomy involving several vertebrae and extending from about the midcervical to the upper dorsal region is done. A typical exposure would be from the fourth cervical to the third dorsal segment. Originally a long, fine, straight needle was inserted between the posterior columns of the spinal cord at intervals of a few millimeters up and down the exposed area, and was moved so as to pass through the commissure. A specially devised myelotome is now used. The procedure may be carried to a segment or two beyond the limits of the laminectomy. The resultant loss of sensation is two or three segments less in extent than the exposed cord. There is a loss of sensation to pinprick, but little if any loss of tactile or position sense. There may be slight atrophy of the small muscles of the hands, but this should not impair usefulness. There is no change in reflexes. In this operation there is obviously some danger of injury to the posterior columns, the anterior-horn cells, and the anterior spinal artery, and still some chance of involving the phrenic-nerve centers. So far as I know, this operation has not been done enough times to enable one to take a definite stand, although it seems to have possibilities. It should be emphasized that the loss of sensation following the operation is limited or segmental in type, and does not involve the entire body below a certain level or include the lower extremities, as is the case in anterolateral chordotomy.

Presacral-nerve section is of value in a limited number of cases with disease largely confined to the cervix or uterus. It is obviously unsuited to cases in which there are widespread metastases. I have had no experience with this operation. It can easily be done by the gynecologist or general surgeon during the course of pelvic surgery.

SUMMARY AND CONCLUSIONS

General considerations in the treatment of pain in cancer have been discussed. The role of referred pain has been mentioned, and the nerve supply involved in head and neck pain has been briefly described. The measures employed in relief of such pain have been listed. The general application of principles underlying the therapy that is employed have been given, and specific measures for relief of pain and their regional application have been offered.

The intractable pain of cancer, unrelieved by local surgery, x-ray or radium treatment or sedation, can be treated directly in a variety of ways—there being some form of treatment for almost every type of lesion in any location—and with some degree of success. The exact percentage of

cervical chordotomy may, however, be done simultaneously with a fair degree of safety. Chordotomy may be employed to help pain as high as the shoulder, but for relief of pain above that level posterior-root section may be necessary, although it should not be done bilaterally. Clinically, with this there is subjective relief from pain. Objectively, there is analgesia and possibly some decrease in temperature sensation to a level a few segments below the point of chordotomy. There is little if any tactile or other sensory disturbance. There should be no motor loss unless the pyramidal tract is injured. There may be some postoperative edema, giving rise to transient weakness of an extremity, and if this occurs it is on the side of the chordotomy, that is, on the side opposite the one involved with pain. Severe and prolonged paresis occasionally results.

To relieve visceral pain, a deeper chordotomy entering the gray matter is necessary. Care must be taken, however, since too deep a cut anteriorly might catch anterior horn cells and result in muscular atrophy or some tactile disturbance. There is frequently a transient bladder-sphincter disturbance in the form of retention, lasting from a few days to a few weeks and sometimes longer. This is especially true in disease of the pelvis or the bladder wall. It may be related in part to reduction of bladder sensation, or possibly to a damaging of the motor tracts to the bladder, though their location in the cord is unknown. These patients must be catheterized early, and are sometimes put on urinary tidal drainage. In some instances we have done cystometrograms both before and after chordotomy. Because of the resulting analgesia and the poor state of nutrition of many of these patients, pressure spots are prone to develop. This necessitates unusual vigilance in the care of the skin. The pain in the analgesic area may return in a few weeks or after a much longer period. Temperature sense returns quicker than pain sense. Pain sense tends to return more quickly after unilateral chordotomy. It is possible that a few pain fibers may ascend in the homolateral spinothalamic tract.

Despite the possible complications mentioned, chordotomy remains the most reliable method for relieving pain below the neck, and I believe it should be preferred in the presence of intractable pain, unless the patient's condition contraindicates all forms of surgery.

Intraspinal (Subarachnoid) Alcohol Injection

The injection of absolute or 95 per cent ethyl alcohol into the spinal subarachnoid space has been employed with increasing frequency for relief of pain of various types, the procedure was introduced in 1931 by Dogliotti. This method of relief of

pain, especially that in the lower back, pelvis and lower extremities, finds a definite field of usefulness. If the patient's condition contraindicates surgery, if life expectancy is short, if radical relief measures are refused, or if the pain is not too wide spread or severe enough to require chordotomy, spinal subarachnoid alcohol injection may be used with expectation of varying degrees of relief in 60 per cent or more of cases. The procedure is employed in diseases of the cervix, rectum, prostate, bladder, and so forth.

For subarachnoid injection the patient is usually placed on his side with the side involved by disease uppermost, and the hips are slightly elevated so as to permit the alcohol, the specific gravity of which is less than that of cerebrospinal fluid, to rise and bathe the proper nerve roots. A small gauge (No. 22) lumbar-puncture needle is used. A spinal puncture is done, and when cerebrospinal fluid is obtained the injection of alcohol is begun, it must be carried out slowly, consuming two or three minutes, so as to avoid too great diffusion, and also to avoid directing a stream of strong alcohol against one point. The process is virtually free from immediate or later discomfort. There may be a slight amount of root pain, but there usually is only a feeling of warmth or burning in the back, hip or leg during the first part of the injection. Relief if obtained is usually immediate, although occasionally it is somewhat delayed.

The location of the puncture and the amount of alcohol used are important. The second lumbar interspace may be used with success in most cases of low back, hip and leg pain. For pain about the genitals, anus or perineum, that is, pain in the sacral or coccygeal segmental distribution, a lower injection into the third or fourth interspace is preferable. In doing the latter type of injection we have recently been using the technic recommended by Drs. J. C. White and W. J. Mixer of the Massachusetts General Hospital. They advise that the lumbar puncture be done with the patient lying prone with the hips slightly elevated. The puncture is easily done, but it may be necessary to verify the entrance into the subarachnoid space by having the patient cough or by exerting suction with a syringe.

The nerve roots tolerate only a limited amount of alcohol. One may safely use a little more in the lower-level injections. In the second lumbar space from 0.5 to 0.6 cc. of 95 per cent alcohol should be the limit. The use of more is liable to produce sphincter disturbance in the form of bladder retention, which may last for a few days, or even a few weeks or longer. In the third or fourth lumbar spaces from 0.6 to 0.8 cc. may be used. Beyond this, one is liable to induce anal incontinence. Amounts greater than those mentioned may also result in

if the patient had been properly anesthetized by proper nerve section, much more effective treatment could have been carried out. With section, notably that of the fifth and ninth nerves in the posterior cranial fossa, a sufficient area of the throat and face is rendered anesthetic so that extensive local treatment, including surgical excision, the implantation of radium, and so forth, can be carried out without a general anesthetic in addition. This relieves the patient of the fear caused by repeated operations under a general anesthetic, brings him back to the general surgeon for more frequent treatments, gives him a better chance to get rid of his cancer before metastases develop, and provides the surgeon with a much better method of handling this difficult problem.

The possibility of producing anesthesia by neurological methods should be emphasized much more strongly and more frequently than it is. Furthermore, it is an extremely useful adjunct in the treatment of cancer, particularly

that of the face and throat, that should be more widely recognized and more commonly used by general surgeons.

Dr. Hodgson. Regarding spinal subarachnoid alcohol injection, I should say that the method which Dr. White and Dr. Mixer have brought out, where the patient lies prone with his hips elevated, represents an advance in the treatment of pain about the genitals, perineum, lower spine and pelvis. One has to be careful not to elevate the hips too much, because one is liable to concentrate the alcohol rather strongly against low roots and thus produce rectal incontinence. So far as I am concerned—and I have used this method a number of times—I feel that it is unsafe to use as much as 1 cc. of alcohol. From 6 to .8 cc. is about enough, this applies to subarachnoid alcohol injection in general.

Dr. Munro's emphasis on nerve section preceding removal of cancer is to the point, and I believe that this order of procedure should be used more often.

complete or partial relief or failure is difficult to determine, and is influenced by the personal equation. Satisfactory relief can be obtained in about 60 per cent of cases.

262 Beacon Street.

DISCUSSION

DR. ERNEST M. DALAND, Boston. I have followed a good many of the cases treated by Dr. Hodgson, and agree with all that he has said. There are two or three other non-neurological factors in the relief of pain in cancer patients. The first is the very obvious one of surgical hygiene. Most of the pain from an infected and ulcerated carcinoma is due to secondary infection. It is quite extraordinary how much relief can be given by removing slough, using wet dressings, and so on.

The second factor is x-ray treatment. Pain from metastatic carcinoma can be controlled very efficiently by very small doses of x-ray. I refer particularly to bone metastases from carcinoma of the prostate. X-ray is specific for relief in these cases. The relief comes on within a very few days, in most cases of carcinoma of the breast, with bone metastasis, it is very quick and it sometimes lasts for many months.

The third factor is the use of drugs. We have been surprised to see what small doses of medication are required for the relief of pain in patients with advanced cancer. In most patients, mild pain can be controlled entirely by aspirin. We start with this drug, and there is no limit to the amount that can be given. The question is often raised whether or not aspirin will damage the heart. An eminent cardiologist recently said that the only people who were damaged by the use of aspirin were those who were afraid to take it. Following aspirin, we give small amounts of codeine, and combine aspirin and codeine. We insist on using hypnotics for sleep, and not narcotics. Eventually, if the pain increases, opiates have to be given, but always in small quantities, so that in the Pondville Hospital, where Dr. Hodgson does a good deal of this neurological surgery, we find very few people with advanced cancer who require morphine in any considerable quantity. I think that of the patients who die there of terminal cancer, only 10 per cent have had morphine at all, and many have had it not more than once a day.

DR. JAMES C. WHITE, Boston. Dr. Hodgson has spoken briefly concerning the treatment of intractable pain by Dogliotti's method of subarachnoid injections of alcohol. Strange as it may seem, this method carries no greater risk of motor paralysis than chordotomy, but only too often it fails to give adequate relief. I think Dr. Hodgson said that in his experience only 10 per cent failed to get relief, in the cases that have been done on the neurological service at the Massachusetts General Hospital, it has been nearer 30 or 40 per cent. When the pain is bilateral, the risk of failure is far greater.

In asking me to discuss this paper, Dr. Mixter suggested that I outline a new modification of Dogliotti's method that we have been using for bilateral pain, limited to the third, fourth and fifth sacral nerves. This is the type of pain that one finds in inoperable carcinoma of the bladder, prostate, rectum and sometimes cervix. If the growth has remained localized in the neighboring soft tissues and has not spread into bone or into the lumbosacral plexus, it will give pain centered around the anus and deep in the perineum. This may be particularly distressing.

Taking advantage of the fact that alcohol is lighter than

spinal fluid, place the patient in the prone position and elevate the pelvis by lowering both ends of the operating table. The tip of the sacrum and lower end of the subarachnoid space are then uppermost. A lumbar puncture between the fourth and fifth vertebrae or between the fifth lumbar and first sacral, can easily be done in this position, but when the needle enters the subarachnoid space, it is necessary to aspirate in order to get out spinal fluid, because there is not enough pressure with the head down for the spinal fluid to flow out of the needle. If a small quantity of 95 per cent alcohol is injected (we have been using 1 or 1.25 cc.), it will float caudally and infiltrate the third, fourth and fifth sacral nerves. This suffices to produce anesthesia over an area of about 15 cm. around the anus, a little way down the thighs and forward over the perineum, scrotum and penis.

We have used this procedure in 6 cases without any subsequent weakness of the legs. The patients were walking around the next day. In my opinion the reason that it does not produce motor weakness, although it knocks out the pain fibers effectively, is that these fibers are less protected by myelin than the motor fibers, and are therefore more sensitive to alcohol. This procedure may and occasionally does weaken bladder sensation. We have not seen this complication in our cases, but I am sure that we shall in the long run, we have therefore limited its use to patients who either were previously on constant drainage, such as those with carcinoma of the prostate, or had only a short time to live and were willing to go on a catheter regime. This method has been used so far in 2 cases of bladder carcinoma, 2 of prostatic carcinoma and 2 of rectal carcinoma. The injections have caused remarkably little disturbance. After being kept flat overnight, as is done in any routine lumbar puncture, the patients have gotten up, and several have been able to go home the next day. The urological cases were all on constant drainage, so that in these we had no trouble from bladder weakness, but even the 2 patients with carcinoma of the rectum were able to urinate after only one catheterization.

Finally I must mention one other point, that relief may not be permanent, but the injection can always be repeated. Mind you, these were terminal cases. In the case of the longest survival, relief has lasted for six months. Two patients had a recurrence of pain, one of them was re-injected successfully, the other one lived too far away, so his pain continued.

In summary, this method is not intended to supplant chordotomy in patients who are favorable operative risks, but in those who are in too poor condition and who have a very short time to live it is a most satisfactory substitute.

DR. DONALD MUNRO, Boston. Dr. Hodgson's paper is much too important in its relation to the problem of cancer as seen by general surgeons to allow it to go without some comment. Certainly this organization can be considered as being cancer-conscious, at any rate cancer-conscious in relation to the lower bowel. There is therefore no reason to exclude the other forms of cancer from discussion.

One of the methods that can be used much more than it is in the treatment of cancer has to do with the production of a permanent local anesthesia in the region of the cancer. This allows more efficient and painless treatment to be given. It applies particularly to cancer in the neighborhood of the throat and face. I have been consulted about the production of this type of anesthesia in a number of such cases, and have been sorry to observe that in almost every case a long time had elapsed during which,

ment that the pain was somewhat relieved by moving about in bed. I should assume, therefore, that these attacks were not coming from peritoneal irritation resulting from an inflamed viscus. The repeated attacks make me think of some recurrent lesion, and this lends a little weight to the assumption that it has not always been an inflammatory process. Another thing which is of interest is that she had residual tenderness along the course of the colon. When we are dealing with a disorder of a colicky sort, such as gallstone colic, ureteral colic or intestinal colic, we often get a lot of valuable information not only out of the history of the acute attack but also from the fact that there is residual soreness, such as we find over the gall bladder after the pain has subsided and, in the case of ureteral colic, along the course of the ureter. After the acute pain begins to subside we may get a little lead from the localization of the residual tenderness.

Perhaps Dr. Hampton will tell us something about the x-rays.

DR. AUBREY O. HAMPTON. This looks like a twenty-four hour film of the colon, it is the only one that shows anything that resembles a diverticulum—low in the pelvis on the right side. The barium enema shows no diverticulum, or anything else that I can see. Here is one local film that looks like the cecum and terminal ileum, and the ileum appears rather narrow. There is no dilatation proximal to it and the mucosal folds are intact. I do not believe the narrowing means anything. I cannot see anything to account for diarrhea and cramps in the abdomen. The heart is that of a fat person who is fairly old.

DR. SWEET. Is there anything that suggests regional ileitis?

DR. HAMPTON. No, I do not believe there is enough to make a positive diagnosis. The mucosa seems to be intact.

DR. SWEET. Of course we have no reason to suspect regional ileitis in this case except that she had had repeated attacks of abdominal pain, but it was not small-intestine pain.

The description of the pain during the last attack is most interesting. Here we have a woman with an attack of pain coming on very suddenly. We also have the picture of a person who is suffering from a colicky pain, not that of peritoneal irritation. A person with peritonitis, either generalized or localized, lies quietly in bed and resists manipulation. This patient felt better when she moved about, and the story suggests a patient writhing in bed with renal colic or something like that. The fact that the pain bore a relation to severe coughing is of interest but perhaps a little difficult to explain.

The only things we have suggesting infection or inflammation are the elevated white count and the slight increase in polymorphonuclear cells. She had a normal temperature, but that in a patient who had been ill only a short time might be consistent with an inflammatory process, especially at the age of fifty-nine years.

What causes do we have for severe colic such as this? We naturally think of calculus. Did she have gallstone colic? I think not. I do not believe she has ever had gallstone colic, according to this history, because of the fact that the pain has not localized in the gall-bladder region. Unless she had a transposed viscus, with the gall bladder on the left side, I think we can readily rule that out. Renal colic will give a picture similar to this. Not infrequently people have ureteral stone which results in abdominal cramps. I have seen several patients and heard of others who were thought to have symptoms indicative of acute intestinal lesions, but who had nothing but renal calculi. We observe that her urine was negative, and that she had, on her second admission, a mass in the abdomen that would be hard to explain on the basis of renal origin unless she had an abnormally located kidney with an intermittent hydronephrosis. So, I believe we can exclude a renal origin for the pain.

What other causes of colic do we have? Did she have small-bowel obstruction? I think not, the pain is not described as being in the location where one would have referred pain of small-intestine origin.

Did she have obstruction of the large intestine—a sudden transitory affair? That is a very definite possibility. She might have had intermittent attacks of volvulus of the sigmoid or intermittent attacks of intussusception. But against that, she never manifested blood in the stools and there is no evidence of anything to incite intussusception, such as tumor or polyp.

Did she have diverticulitis of the sigmoid? Dr. Hampton has pointed out one site of a diverticulum. I should be inclined to omit that in the differential diagnosis because of the fact that the pain was so sudden in onset and because of the character of the pain, although of course we do have the fact that with the second attack she had local tenderness over the mass which was in the region of the sigmoid. All things considered I feel that she did not have diverticulitis of the sigmoid. Before we finish talking about the intestinal tract, we should consider the possibility of one of those rare internal hernias with a loop of intestine caught in a peritoneal fossa which might give her a sudden attack of intestinal obstruction. We have no evidence for it. It might be difficult to explain the tumor on that basis, but such a le-

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24081

PRESENTATION OF CASE

First Admission A fifty-nine-year-old American housewife entered the hospital with the complaint of recurring attacks of abdominal cramps occurring over a period of eight years.

During the ten years before entry she had had six or eight attacks of generalized abdominal cramps with some nausea and occasional diarrhea, but no vomiting. The attacks occurred at irregular intervals, lasted three to four days and were relieved by rest in bed, a simple diet and sedatives. She did not pass blood, pus or mucus by rectum. Three days before entry she had another attack which consisted of severe cramps, severe diarrhea and some nausea, but no vomiting or fever.

Her past history and family history were noncontributory. At the age of twenty she had weighed about 135 lb., and her weight had gradually increased until the time of entry, when she weighed about 180 lb. Her menstrual history was negative, with a normal menopause at the age of fifty.

Physical examination revealed an obese woman complaining of cramplike pain in the abdomen. There was generalized abdominal tenderness which seemed to follow the course of the colon. There was no tenderness in the region of the gall bladder, and no icterus. The pain was somewhat relieved by the patient moving about in bed.

The temperature was 98.6°F., and the respirations were 20.

The urine examination was negative. The blood showed a white-cell count of 11,100 with 65 per cent polymorphonuclears.

An x-ray of the chest showed the heart shadow to be slightly enlarged downward and to the left. The aorta was tortuous and prominent in the region of the knob, and the diaphragm was a little high on both sides and moved normally with respiration. The lung fields were clear. A gastrointestinal x-ray series and a barium enema were negative. A Graham test showed only a faint shadow of the gall bladder with many ringlike shadows in it which had the characteristic appearance of gallstones.

She was discharged after a week in the hospital

and went home on a regime including a low calorie, low-residue diet, frequent rest periods, and improved bowel hygiene.

Final Admission (nine months later) She was well until eight months after discharge, when she had a bad head cold. This cleared furly promptly but left her with a severe cough. Three weeks later she noticed pain in her left lower quadrant which occurred only on coughing and lasted for a few minutes, but was severe enough to justify calling her physician. Four days later she suddenly developed very severe pain in her left lower quadrant which came on during a coughing spell and persisted. One hour later she was seen by her physician who found her bent over the back of a chair moaning with severe pain in the left lower quadrant. The pain was constant, but somewhat spasmodic, coming and going in waves, although she was never entirely free from pain. It was so severe that she could not lie quietly in bed. It was difficult for her to straighten up, and she preferred to remain somewhat bent over. She had no nausea or vomiting.

Physical examination revealed nothing abnormal in the heart and lungs, the blood pressure was 120 systolic, 80 diastolic. Marked spasm and tenderness were noted in the left lower quadrant over an area about the size of a man's hand. The tenderness was so acute that the examination was not entirely satisfactory. There was an indefinite feeling of a mass about the size of a grapefruit in the region normally occupied by the sigmoid, which extended up to the level of the umbilicus and down to the brim of the pelvis. Pelvic examination revealed an atrophied cervix. There was no tenderness in the vaults, and the fundus could not be felt, manual examination was impossible because of pain. The rectal examination was unsatisfactory because of hemorrhoids.

The temperature was 98.6°F., the pulse 100. The respirations were 20.

The blood showed a white-cell count of 17,400 with 80 per cent polymorphonuclears. The urine examination was negative.

She was given a subcutaneous injection of Panto-pon which gave her no relief. Two hours later the white-cell count was 16,000, and shortly thereafter an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. RICHARD H. SWEET It is interesting to note that the pain was colicky. It was a cramp-like pain, not a steady one, and therefore tends to make us believe that she was not suffering primarily from an inflammatory process. Another thing which more or less bears this out is the state-

from below. However, this diagnosis would have explained everything—the suddenness of onset, the severe pain, the mass, and the white count. I will say this, that when she had spinal anesthesia the mass felt quite different from what it had before and we got our first true suspicion of what might be the matter, it then felt as if it were definitely in the abdominal wall and not within the abdominal cavity. When we opened her rectus sheath we found a large hematoma. She had ruptured her deep epigastric artery and had bled profusely into the abdominal wall.

DR. MALLORY. We have a significant number of cases every year in which lesions in the abdominal wall are mistaken for intra-abdominal disease and it seems worthwhile reminding people occasionally of the possibility

PREOPERATIVE DIAGNOSIS

Volvulus of the sigmoid

DR. SWEET'S DIAGNOSIS

Volvulus of the sigmoid

ANATOMICAL DIAGNOSES

Rupture of deep epigastric artery
Hematoma of the abdominal wall

CASE 24082

PRESENTATION OF CASE

A twenty-four-year-old American housewife entered the hospital complaining of pain and swelling of the left knee of four years' duration.

About four years before entry, two months after her marriage, the patient first noticed pain and swelling of her left knee which lasted for two weeks and subsided spontaneously. At the birth of her first child a number of months later she had a similar attack lasting two or three days. She had no further symptoms until twenty-three months before entry when she noticed that her knee became painful after much use. Eighteen months before entry x-rays were taken by her physician and she was advised to have her teeth extracted, which gave her no relief. Six months before entry the pain had become so severe that she was forced to discontinue her work at a shoe factory. The application of heat to the knee caused an exacerbation of the pain. For the two months before entry she had had to use crutches, and a cast had been applied without relief shortly before she came to the hospital. Her general health had been good, but her weight had fallen from 154 to 126 lb.

Her family and past histories were noncontributory.

Physical examination revealed a well-developed

and nourished woman in no apparent discomfort. Her heart, lungs and abdomen were negative. Her blood pressure was 124 systolic, 76 diastolic. There was thickening of the periarticular structures about the left knee with swelling, heat and tenderness, most marked over the region of the internal femoral condyle. The knee was not reddened. There seemed to be a slight excess in the amount of fluid, but ballottement of the patella was unsatisfactory because of pain. No definite fluctuation was detected, and no involuntary spasm could be made out. There was a flexion deformity of 30°, and the range of motion was from 90 to 130°, with both limits marked by pain. The knee jerk was normal.

The temperature was 99°F., the pulse 100. The respirations were 20.

The urine examination was negative. The blood showed a white-cell count of 9400 with 69 per cent polymorphonuclears, and a hemoglobin of 85 per cent. A tuberculin test using a 1:500 dilution was positive, but the 1:5000 and 1:10,000 dilutions were negative. The serum calcium was 11.65 mg per cent, and the phosphorus was 4 mg per cent. The blood Hinton test was negative. A lumbar puncture was negative. No gram-negative diplococci were seen in a vaginal smear.

X-rays of the knee showed a rather extensive process involving the lower portion of the shaft of the femur. There was spur-like formation of the periosteum along its medial side and onion-layer periosteal thickening along the lateral side, producing a widening of the shaft of the femur from the lower border of the articulating surface to the level of the top of the accessory joint space. There were multiple areas of mottling within the shaft of the bone, with destruction of considerable portions of the cortex. There was very little bone atrophy, there was considerable soft-tissue shadow in the region of the upper portion of the joint capsule, but it could not be determined whether it was within the capsule or external to it. The articulating surfaces were smooth, and there was no widening of the joint space. X-rays of the chest were negative.

On the ninth day an attempt was made to aspirate the knee, but nothing was obtained. Four days later an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. ERNEST M. DALAND. The first thing to settle is whether this was an inflammatory condition in the knee or joint, or whether it was a neoplasm. Four years before entry she noticed pain which subsided within two or three days. She went along for a number of months and had pain again for two or three days, and five months later had some

sion ought to be mentioned in a complete discussion of the possibilities

Is there anything connected with the pelvic viscera which might have caused these symptoms? I doubt it very much, because she has had a history of such long standing, with many attacks of pain of this same sort. If this were due to a cyst or a pedunculated fibroid with twisted pedicle or some other such source, I should expect that someone would have operated and removed the offending organ during one of the previous attacks. So I doubt that this is a cyst with a twisted pedicle or a pedunculated fibroid, although with this type of story we might very well make that diagnosis, especially with the elevated white count and relatively low temperature. I presume that it will be next to impossible for me to make the correct diagnosis in this case, but I have a feeling that the suddenness of the onset of the attacks and the fact that she has had previous attacks of a similar nature suggest that there is some mechanical obstruction to some viscus which has been repeated in the past and is perhaps the cause of the present difficulty. Considering the type of the pain, the location of the pain, the past history and the presence of tumor in the left lower quadrant in the region of the sigmoid, it would be reasonable, though probably not correct, to say that she had had a volvulus of the sigmoid, and I make that my diagnosis.

DR WILLIAM B BREED I should like to ask Dr Hampton if he could rule out a diverticulum, which had produced symptoms nine months previously, as a cause of her present symptoms.

DR HAMPTON I think that the absence of diverticula is good evidence that it was not diverticulitis. We have seen one or two rare cases of diverticulitis where we did not see diverticula, the patients had only one or two in the whole colon and these were obliterated by disease. I think it is probable that such cases could not be diagnosed by x-ray examination.

DR WYMAN RICHARDSON It is interesting that her attacks of pain started with a cough, and I wonder, with the temerity of a medical man, if this is not strangulated hernia. Can they not go up instead of down?

DR. SWEET Yes, that is why I thought of intestinal strangulated hernia. It is a very rare lesion.

DR TRACY B MALLORY We have broken a precedent in this case because we ordinarily take up only cases from which some specimen has reached the laboratory as objective evidence of the diagnosis. In this case there was no specimen to examine. Dr Allen can tell us about what he found and perhaps will discuss his preoperative diagnosis.

DR ARTHUR W ALLEN I saw this woman in

the middle of the night and had a hard time coming to any conclusion about what was the matter with her. I finally arrived at the same diagnosis that Dr Sweet has made. She was a short, fat person and difficult to examine. I tried to connect her present illness with her past history and that is where both Dr Sweet and I fell down, because her present illness had nothing whatever to do with the preceding attacks of which she had complained. What they were due to, I have no idea—perhaps to dietary indiscretion.

The first thing that occurred to me when I saw her was a strangulated hernia. I think it is not always possible to be sure you are not dealing with strangulated interstitial hernia, but this mass was much too tender for one thing. It did not feel like any strangulated hernia that I had ever seen, and it was in the wrong location. It was well above the inguinal region and not far enough out in the flank to be one of those peculiar hernias that occasionally occur there. There is one thing not given in the history which it is only fair to state, and that is that bimanually one could be almost certain of being able to ballot this mass between the examining hands. I recall this fact quite distinctly.

The suddenness of the onset made me feel that it had to be a mechanical affair, and I had a hard time explaining the white count on the basis of the diagnosis that I made. I should be surprised if a torsion of the sigmoid would give a white count of 17,000 in a matter of hours. Her symptoms started at seven or eight o'clock at night, and I saw her shortly after midnight. I thought her white count might be in some way related to her upper-respiratory-tract infection, which she still had. The other thing that Dr Sweet did not mention and that I very seriously considered was whether her three weeks of some sort of illness with fever and so forth might have been due to an acute inflammatory gall bladder and that the gall bladder had eroded into the intestine and produced a gallstone ileus. We got out the x rays that had been made nine months previously and did not believe that her stones were large enough to produce obstruction, and besides, the character of the onset was not typical of gallstone ileus. I have never seen such a patient who did not vomit. Of course they do not occur every day, but when they do there is usually a story of vomiting with the obstruction, which is usually very definitely of the small-bowel type, and as a rule you do not feel a mass.

The question of twisted ovarian cyst was very carefully considered, and we felt that that probably was unlikely on the basis that this mass felt much too superficial. You could get at it too easily.

PREOPERATIVE DIAGNOSIS

Neoplasm of the left femur

DR DALAND'S DIAGNOSIS

Ewing tumor of the femur

ANATOMICAL DIAGNOSIS

Lymphosarcoma of the left femur

PATHOLOGICAL DISCUSSION

DR. MALLORY This case is a good illustration of the truth of Dr. Codman's remark about Dr. Taylor's case several weeks ago: if the clinicians and radiologists cannot make a diagnosis it is generally pretty difficult for the pathologist to make one. It is fairly easy to rule out certain things. It certainly is not an osteogenic sarcoma or a Ewing tumor. It falls in the general group that we include in the diagnosis of lymphoma, but when it comes to subclassifying it further we begin to get a difference of opinion. We classified this, and I think all of us are still ready to stick by it, as a primary lymphosarcoma. Dr. Frederic Parker, Jr., has, I believe, seen the sections and is inclined to think it is Hodgkin's disease of the sarcomatous type. He believes that true lymphosarcoma probably never appears primarily in bone. It is true there are a few multinucleated cells here which are indistinguishable from those seen in Hodgkin's disease, but they represent a very small proportion of the tumor cells. The great majority of them look like lymphoblasts and young lymphocytes. This patient also has been followed over a period of three years and when last seen was free from recurrence.

Dr. Simmons, would you be willing to say a

word about the duration of life of these bone-tumor cases?

DR. SIMMONS I have recently been reviewing the cases of osteogenic sarcoma and other malignant tumors primary in long bones that were seen in this hospital from 1920 to 1932. In this period there were 34 cases which were operated on, and I was much surprised to find that 11 were living without evidence of disease five or more years after operation. This proportion of 30 per cent five-year cures is much higher than the usual figures given for the curability of osteogenic sarcoma. It seemed worth while, therefore, to try to analyze the material further in an attempt to find some factor which might bear upon the question of prognosis. The osteogenic sarcomas could, apparently, be divided into two groups: one of rapidly growing tumors containing very pleomorphic cells, the second of tumors consisting predominantly of fibrous tissue or well-formed cartilage. None of the first group lived, whereas there were 9 survivors among the second. Another group of malignant tumors primary in bone which can be cured are the reticulum-cell sarcomas. There were 2 such cases in this series. One was operated on in 1924. In 1931 a massive recurrence developed in the soft parts above the operative stump. This was removed and the patient is perfectly well seven years later. A second case was operated upon in 1921 and died in 1935, fourteen years later, of a tumor in another bone. All the cases of Ewing sarcoma, of which there were 9, are dead. Our experience, here, is certainly different from that of other hospitals such as, for instance, the Children's Hospital. Their experience has led them to believe that osteogenic sarcoma is a uniformly fatal disease.

teeth extracted. It is a question whether this knee condition dates back the full four years or whether in retrospect some unrelated episodes were picked out of her history. Her physician apparently thought she had an inflammatory knee and advised extraction of the teeth. The loss of weight is significant. The thickening of the periarticular structures, the cell count and the tenderness over the internal femoral condyle are also very significant. We should pay attention to the local heat and tenderness, although there was no redness of the skin. It was believed that there was some fluid in the joint, but the history tells us that when the knee was subsequently aspirated no fluid was obtained. I call your attention to the fact that she had a temperature of only 99° , which is against infection. The white count was 9400 and the smear contained 69 per cent polymorphonuclears, that is very definitely against an infection. We have nothing to lead us to think that she had an osteomyelitis, and the low white count and polymorphonuclears are definitely against it. The possibility of tuberculosis involving the knee joint was considered, and the tuberculin test, using a 1:500 dilution, was positive. I think that can be thrown out as not significant in view of the fact that higher dilutions were negative. The calcium and phosphorus metabolism was apparently normal, which helps us to rule out a parathyroid condition. I think that we have no reason to believe there was an acute periarticular inflammatory arthritis, although that was apparently considered since a vaginal smear was done in a search for gonococci.

We come down to the x-ray examination with a very definite feeling that her trouble is due to a neoplastic condition rather than to an inflammatory one. The x-ray examination shows a single lesion in the lower end of the femur, which is characterized by both destruction and proliferation of the cortex and by the absence of any definite soft-tissue tumor. There was thickening, seen best in this film, which was probably in the capsule of the joint. The joint surfaces, however, were smooth, and the joint spaces of normal width. If this thickening were due to either tuberculosis or any other infection, I should expect more changes in the joint itself, but tumor may infiltrate a joint capsule and in that case you might get such a picture as you see here. The extent of this tumor up the shaft of the bone is considerable, yet it has not gone through the cortex completely, in other words it does not look like a primary osteogenic tumor, but here again it may belong with the irregular group. I do not believe that we have to consider tuberculosis or osteomyelitis very seriously. Syphilis should always be thought of in such a condition, but I do not consider that very seriously here.

Before seeing the x-ray I was inclined to think it was osteogenic sarcoma. The other possibility is a Ewing tumor. We do see here a little of the onion-layer appearance which, if it were more distinct, would be definitely in favor of Ewing tumor. There is no ray formation, which would be more suggestive of osteogenic sarcoma. As to age,—this woman was twenty-four,—she falls into the late group of those having a Ewing tumor and into the middle of that of those with osteogenic sarcoma, the latter usually occurring between the ages of twenty and thirty. We think of people under twenty as belonging to the Ewing group, and over twenty to the osteogenic class. The absence of a soft-tissue tumor, even with a story going on for two or three years, is definitely against an osteogenic sarcoma. The slight rise in temperature, the slight rise in white count and the local heat are more in favor of Ewing tumor, although we ordinarily see more of a rise in temperature and are rather more apt to see a white count of 12,000. I believe there is nothing suggesting a cystic condition such as osteitis fibrosa cystica or a solitary cyst. About half of all osteogenic sarcomas recorded in the literature occurred in the lower end of the femur. This is a region where we should expect to find either a Ewing tumor or an osteogenic sarcoma, but not metastatic cancer. Metastases are much more apt to appear in the upper part of the femur in the subtrochanteric region, and this woman was a little young to expect metastatic cancer, so the diagnosis is unlikely although it cannot be absolutely ruled out. Nothing here suggests any other trouble and my feeling is that this is a Ewing tumor.

DR TRACY B. MALLORY: Dr Simmons, have you any comment to make?

DR CHANNING C. SIMMONS: I am not sure but I believe I know the case. Although I should agree with Dr Daland that the tumor is not metastatic, I do not believe it is a Ewing tumor. It is a tumor of long duration, if the history is correct. The Ewing tumor ordinarily involves the shaft rather than the lower end of the bone. It is a bone-destructive rather than bone-formative tumor, and this case shows both. Although Ewing tumor in the later stages can cause a great deal of secondary bone formation, it is usually not infiltrative. The mottled appearance is not at all inconsistent with malignant lymphoma or reticulum-cell sarcoma. We have no record of a differential count. I do not know whether it would help us. The phosphatase value is not mentioned. My feeling would be that it probably is a tumor of the group of reticulum-cell sarcoma or lymphoma rather than primary bone tumor.

other a person with civic and executive experience" While it is true that some question as to the qualifications of these two commissioners was brought up at the legislative hearing on the proposed bill, the members of the Special Commission were unanimous in supporting the bill, which reads, in part, as follows

The commissioner and the first associate commissioner shall be physicians who are diplomats in psychiatry of the American Board of Psychiatry and Neurology, Incorporated, and shall have had at least seven years experience on the staff of a state or federal hospital for mental diseases or in any equivalent psychiatric organization. The second associate commissioner, if not qualified as aforesaid, shall be a physician who has had at least seven years experience on the staff of a hospital for general medical and surgical cases.

The *Journal* is of the opinion that it would be very difficult to find an expert psychiatrist who, at the same time, would be either a well-trained engineer or an able steward—such a feeling is also implied in the proposed bill. As the construction and physical maintenance and the house-keeping problems of institutions connected with the Department of Mental Diseases, or the proposed Department of Mental Health, are of utmost importance to the proper functioning of the department, it seems advisable that well-qualified and well-trained experts in these particular aspects of mental hospital care should have extremely responsible positions therein.

In view of the *Journal's* stand in regard to the dangers of overcentralization of power, it is gratifying to be informed that the section of the bill recommending that the power of appointment of the medical personnel and other employees should be transferred "from the trustees to the department" should read "from the trustees to the superintendents." The mistake is said to be due to technical errors in the preparation of the draft.

At a recent meeting of the Committee on State and National Legislation, the members recommended unanimously that the bill be supported by the Massachusetts Medical Society.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No. 60 PREMATURE SEPARATION OF THE PLACENTA

Mrs. T. B., a white, twenty-three-year-old primipara, seven and a half months' pregnant, was advised by her physician to go to the hospital on May 20, 1937. While at dinner, she had experienced some low abdominal discomfort, which was followed two hours later by staining. An hour later she began to flow, with increased discomfort.

The family history was essentially negative. There was no history of scarlet fever, diphtheria, rheumatic fever or chorea. At thirteen the patient had had pneumonia, at fourteen her appendix had been removed, and at nineteen her tonsils and adenoids. Catamenia began at thirteen and were of the twenty-eight-day type, lasting five days without pain. Her last period was October 1, 1936, making her due July 7, 1937.

She had consulted her own physician at the very beginning of this pregnancy and had been seen routinely since then. Her blood pressure at routine visits had averaged 120 systolic, 68 diastolic. There had been no edema, and the urine had been negative except for a very slight trace of albumin during the first two months. The patient was last seen ten days previous to entrance to the hospital, at which time her examination was normal, and the blood pressure 122 systolic, 90 diastolic.

The patient was admitted to the hospital after a journey of eighteen miles by automobile. At the time of entrance she was flowing moderately. The pain in the abdomen had increased since her telephone conversation with the doctor and was very severe. The baby was active.

On physical examination the patient was well developed and nourished. Her pupils were equal and reacted normally. Mouth and throat were normal. The heart showed no enlargement, there were no murmurs. The lungs were normal to percussion, there were no rales. The abdomen was symmetrically enlarged by a pregnant uterus of approximately seven and a half months' size. The uterus was in contraction, was very tender to

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

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THE VERMONT STATE MEDICAL SOCIETY

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improvement fails to occur. The information gained in this way is one of the best guides in determining dosage in the serum treatment of pneumonia.

Blood cultures are also valuable in verifying the type of pneumococcus responsible for the infection. When a sputum sample is unsatisfactory and pneumococci are scarce, there is great danger that the typing report may represent a throat organism and not one causing infection in the lung. This fact may sometimes account for apparently poor results in serum therapy. If the pneumococci in both the blood culture and the sputum are identical, serum therapy can be continued with confidence that the proper type is being used.

The Massachusetts Department of Public Health announces in another column that arrangements are being made to have a number of additional laboratories undertake to examine blood cultures taken from pneumonia patients. This increase in the availability of the procedure should make it possible for physicians to follow their cases much more closely and should result in the saving of additional lives by the use of serum. The further announcement that arrangements are being made to compensate laboratories for tests done on patients who are unable to pay should also be welcome to physicians who have had difficulties in the past in arranging for laboratory work on such individuals.

BLOOD CULTURES IN PNEUMONIA

RECENT experience in treating pneumonia with specific serum has demonstrated the great usefulness of determining whether the pneumococci have invaded the blood stream. Cases showing positive blood cultures usually follow a stormy course and are much more likely to end fatally than those in which the pneumococci are never found in the blood stream. To save life in the presence of bacteremia much larger doses of serum must be used. At least one blood culture should be taken on every patient treated with serum, and repeated cultures should be made on those in whom prompt

DEPARTMENT OF MENTAL DISEASES—A CORRECTION

It has been called to our attention that an error was made in the editorial "Department of Mental Diseases" which appeared in the February 3 issue of the *Journal*. In speaking of the qualifications of the commissioners of the proposed Department of Mental Hygiene, as submitted by the Special Commission, it was stated "Of the other two [the second and third commissioners], one would be a physician, not necessarily a psychiatrist, and the

Acute Anterior Poliomyelitis — Its Diagnosis and Treatment
 May 2
 Sepsis May 9
 Meetings to be held at the Union Hospital, Mondays, at 4.30 p m.

Howard P Sawyer, M.D.,
 Robert H. Goodwin, M.D.,
Chairmen

ESSEX NORTH DISTRICT

Place LAWRENCE

SUBJECT	DATE
Atelectasis in the Newborn	March 11
Bleeding in the First Trimester of Pregnancy	March 18
Treatment of Burns	March 25
Bleeding in the Last Trimester of Pregnancy	April 1
The Use of Vitamins in Pediatric Practice	April 8
Cesarean Section Analgesia	April 15
Drug Therapy in Pediatrics	April 22
Toxemias	April 29
Acute Anterior Poliomyelitis — Its Diagnosis and Treatment	May 6
Sepsis	May 13

Meetings to be held at the Lawrence General Hospital, Fridays, at 4 p m.

John Parr, M.D., *Chairman*

FRANKLIN DISTRICT

Place GREENFIELD

SUBJECT	DATE
Differential Diagnosis and Treatment of Scarlet Fever	March 9
The Use and Misuse of Prontylin	March 16
Some Complications of Labor, Analgesics in Labor	March 23
Rheumatic Infection, Rheumatic Heart Disease	March 30
Recent Advances in the Diagnosis and Treatment of Heart Disease	April 6
Pneumococcus Pneumonia and Serum Therapy	April 13
Gonorrhea in the Male	April 20
Early Syphilis	April 27

Meetings to be held at the Franklin County Hospital Wednesdays, at 8 p m.

Halbert G Stetson, M.D., *Chairman*

HAMPSHIRE DISTRICT

Places HOLYOKE, SPRINGFIELD

SUBJECT	DATE
Rheumatic Infection, Rheumatic Heart Disease	March 10
Recent Advances in the Diagnosis and Treatment of Heart Disease	March 17
Pneumococcus Pneumonia and Serum Therapy	March 24
Gonorrhea in the Male	March 31
Early Syphilis	April 7
Some Complications of Labor, Analgesics in Labor	April 14
Differential Diagnosis and Treatment of Scarlet Fever	April 21
The Use and Misuse of Prontylin	April 28

Meetings to be held Thursdays at the Academy of Medicine, Professional Building 20 Maple Street, Springfield,

at 4 p m, and in the Outpatient Department of the Skinner Clinic, Holyoke Hospital, Holyoke, at 8 p m

George D Henderson, M.D.,
 George L. Schadt, M.D.,
Chairmen

HAMPSHIRE DISTRICT

Place NORTHAMPTON

SUBJECT	DATE
Early Syphilis	March 9
Gonorrhea in the Male	March 16
Differential Diagnosis and Treatment of Scarlet Fever	March 23
The Use and Misuse of Prontylin	March 30
Rheumatic Infection, Rheumatic Heart Disease	April 6
Recent Advances in the Diagnosis and Treatment of Heart Disease	April 13
Pneumococcus Pneumonia and Serum Therapy	April 20
Some Complications of Labor, Analgesics in Labor	April 27

Meetings to be held in the Nurses Home of the Cooley Dickinson Hospital, Wednesdays, at 4 15 p m.

Warren P Cordes, M.D., *Chairman*

MIDDLESEX SOUTH DISTRICT

Place CAMBRIDGE

SUBJECT	DATE
Bleeding in the First Trimester of Pregnancy	March 9
Atelectasis in the Newborn	March 16
Bleeding in the Last Trimester of Pregnancy	March 23
Treatment of Burns	March 30
Cesarean Section Analgesia	April 6
The Use of Vitamins in Pediatric Practice	April 13
Toxemias	April 20
Drug Therapy in Pediatrics	April 27
Sepsis	May 4
Acute Anterior Poliomyelitis — Its Diagnosis and Treatment	May 11

Meetings to be held at the Cambridge Municipal Hospital, Cambridge Street, Wednesdays, at 4 p m.

Edmund H. Robbins, M.D., *Chairman*

FACULTY

Gonorrhea and Syphilis Chairman Dr E. Granville Crabtree. Instructors Drs J Dellinger Barney, Oscar F Cox, Jr, Roger C Graves, George C Prather, Rudolph Jacoby and C Guy Lane.

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Pneumonia Chairman Dr Frederick T Lord. Instructors Drs Maxwell Finland and Joseph H. Pratt.

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the touch, and showed no relaxation at any time. The fetal heart sounds were heard at the rate of 140 per minute. By rectal examination the cervix was found to be long, firm and undilated, there was no evidence of placenta previa. A consultant was called who agreed that the diagnosis was early separation of the placenta and that the procedure of choice was cesarean section.

A low transverse cervical cesarean section was performed. The uterus was firmly contracted around the fetus, and there was slight discoloration in the lower uterine segment near the left broad ligament. The baby was extracted without difficulty, breathed immediately, and weighed 4 lb, 9 oz. The placenta on removal showed a small area, approximately 5 cm in diameter, near the lower border which was discolored by dark adherent blood clots. The uterus contracted well after the operation. The patient made an uneventful recovery, and the baby was 6 oz above the birth weight on discharge from the hospital.

Comment. Cases of premature separation of the placenta occur without definite etiology. Some separated placentas occur with toxemia, others are certain to follow direct trauma, but neither was present in this particular case. The diagnosis of partial separation of the placenta in this case was based upon the firmness of the uterus, the presence of the fetal heart, and a rectal examination which did not reveal a placenta previa. Cesarean section on cases of partial separation of the placenta, where the baby is viable and the patient not in labor, is becoming the accepted method of delivery. Had this baby been dead, the more conservative procedure of rupturing the membranes, packing the cervix and applying fundal pressure would have been the operation of choice. Had the patient been in labor with either a dead or a living child, vaginal delivery should have been considered. Were the cervix soft and dilatable, rupturing the membranes and allowing labor to proceed would be the procedure of most men. The old-fashioned accouchement forcé,—manual dilatation of the cervix,—is an operation which is never done today. The cervix cannot be treated with too much respect, and manual dilatation of any cervix that is not obliterated, soft, and dilated at least three or four fingers is to be condemned.

NOTICE TO FELLOWS OF THE MASSACHUSETTS MEDICAL SOCIETY

THE *New England Journal of Medicine* is sent to all fellows whose dues are fully paid. After March 1, delinquent fellows are dropped from the mailing list. All fellows are urged to remit their

dues for the current year to their district treasurers before March 1.

CHARLES S. BUTLER, M.D., *Treasurer*

POSTGRADUATE EXTENSION COURSES

The programs of instruction to be given this spring by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau are listed below. These courses are offered free to all legally registered physicians in Massachusetts.

BARNSTABLE DISTRICT

Place HYANNIS

SUBJECT	DATE
Rheumatic Infection, Rheumatic Heart Disease	March 6
Recent Advances in the Diagnosis and Treatment of Heart Disease	March 13
Gonorrhea in the Male	March 20
Early Syphilis	March 27
Some Complications of Labor, Analgesics in Labor	April 3
Differential Diagnosis and Treatment of Scarlet Fever	April 10
The Use and Misuse of Prontylin	April 17
Pneumococcus Pneumonia and Serum Therapy	April 24

Meetings to be held at the Cape Cod Hospital, Sundays, at 4 p. m.

John I. B. Vail, M.D., *Chairman*

BERKSHIRE DISTRICT

Place PITTSFIELD

SUBJECT	DATE
Pneumococcus Pneumonia and Serum Therapy	March 10
Some Complications of Labor, Analgesics in Labor	March 17
Rheumatic Infection, Rheumatic Heart Disease	March 24
Recent Advances in the Diagnosis and Treatment of Heart Disease	March 31
Gonorrhea in the Male	April 7
Early Syphilis	April 14
Differential Diagnosis and Treatment of Scarlet Fever	April 21
The Use and Misuse of Prontylin	April 28

Meetings to be held at the House of Mercy Hospital, Thursdays, at 4 30 p. m.

Melvin H. Walker, Jr., M.D., *Chairman*

BRISTOL SOUTH DISTRICT

Place FALL RIVER

SUBJECT	DATE
Atelectasis in the Newborn	March 7
Bleeding in the First Trimester of Pregnancy	March 14
Treatment of Burns	March 21
Bleeding in the Last Trimester of Pregnancy	March 28
The Use of Vitamins in Pediatric Practice	April 4
Cesarean Section Analgesia	April 11
Drug Therapy in Pediatrics	April 18
Toxemias	April 25

operations were done. Two hundred and fifty babies were born in the hospital.

Dr Sven Gundersen was the guest speaker at the annual meeting of the Belknap County Medical Society. His topic was "Serum Treatment of Pneumonia."

DEATHS

SISKE—HARRY E. SISKE, M.D., died at the Hanover Hospital on November 2. He was born in Monson, Massachusetts, in 1877, and was graduated from Monson Academy and Tufts College Medical School.

He had been employed as a physician at the State Hospital in Concord, at the Penal Institution at Providence, Rhode Island, and at the Memorial Hospital in Pawtucket, Rhode Island. He had also been roentgenologist at St. Joseph's Hospital, Providence, Rhode Island. At the time of his death Dr Siske was assistant superintendent at the New Hampshire State Sanatorium at Glenduff.

In 1927 he was married to Ethel Bennett Stubbs of South River, New Jersey.

Dr Siske was a member of the Grafton County and New Hampshire medical societies.

PLATTS—HARRY S. PLATTS, M.D., of Troy, died on January 5. He had practiced medicine in Troy for more than thirty-five years.

Dr Platts was born in 1876. He was graduated from the Dartmouth Medical School in 1898, and was a member of the New Hampshire Medical Society, the Masonic Order and the American Legion.

LUNDERVERVILLE—EVERETT P. LUNDERVERVILLE, M.D., died February 4 at his home in Berlin. He was born in 1874 at Enosburg Falls, Vermont, the son of Mr and Mrs Matthew Lunderville.

Dr Lunderville graduated from the University of Vermont College of Medicine in 1896. He was also a registered pharmacist. Before going to Berlin twenty years ago, he practiced medicine in St. Albans and Richford, Vermont. He was married to Hortense Virginia Paquet in St. Albans, Vermont, in 1900.

Dr Lunderville is survived by his widow, one daughter, Mrs. Everett J. Carney, of Bellows Falls, Vermont, one brother, and two sisters.

VERMONT STATE MEDICAL SOCIETY

MAURICE—GEORGE B. MAURICE, M.D., of Waterville, Vermont, died November 30, 1937. He was in his sixty-fifth year.

Born in Waterville, Vermont, the son of Daniel F. and Mary P. Maurice, he received his early education there. He received his degree from the University of Vermont College of Medicine in 1899 and had practiced in Waterville for nearly forty years. Dr Maurice was a member of the Vermont State Medical Society.

His widow survives him.

MISCELLANY

DR. JAMES MINOT HONORED

At the annual meeting of the Boston Tuberculosis Association held February 15 a new office was created, that of honorary president, and Dr James J. Minot, of 188 Marlboro Street, Boston, who was a founder of the Association in 1903, was elected to fill this office. In making the nomination Dr Reginald Fitz spoke as follows:

On April 21, 1903, at the suggestion of Dr Minot, a

group of gentlemen met in the library of his Boston home to form the Boston Association for the Relief and Control of Tuberculosis. In this manner our Society originated. Ever since that day Dr Minot has given, continuously, enthusiastic and imaginative service to the Association. In the early days, his efforts were largely instrumental in bringing it about that tuberculosis in Boston was made a reportable disease and it became possible to discover how many cases there were in the community and how significant was the tuberculosis problem. Presently he organized a day camp on Parker Hill for the care of tuberculous patients. The Boston Sanatorium is an outgrowth of this action. He then helped to develop outdoor schools for tuberculous children and methods for stamping out tuberculosis by examining contacts. He became influential in developing municipal health clinics where cases were followed or where individuals suspected of harboring tuberculosis were skillfully examined and in establishing laboratories wherein the diagnosis of tuberculosis was made scientifically. He was soon recognized as a pioneer in educating the public in regard to the menace of tuberculosis and in enlisting public interest in the fight against it. As time went on he became increasingly impressed with the necessity for preventing tuberculosis. Hence, nutrition clinics for delicate children grew up in our schools and the Prendergast Preventorium came into being. He has helped to raise large sums of money to fight tuberculosis, money raised from a host of small contributions through the selling of Christmas Seals each year and through certain individual citizens who have contributed to the cause in a more significant manner from time to time because of his honest, dogged pleading. In brief, for thirty-five years without interruption, Dr Minot has set the pace toward wiping out the menace of tuberculosis in Boston. He has done all in his power to improve methods of diagnosis and treatment for the ill so that they might be cured, and to forestall the development of the disease in those who were not ill by sensible means of prevention. Since 1919 he has served our Association as vice president. It is the well-considered opinion of the Executive Committee that after so long a term of service a more disjunctive office should be made for him. The Executive Committee wishes to have the benefit of his counsel and inspiring influence in its work, on the other hand, the committee does not wish to overload him with administrative details. Therefore, the committee asks that a new office in the roster of the Association be created that of honorary president. To fill this office, it is my privilege to bring before you for consideration the name of James Jackson Minot. I move that the members of the Boston Tuberculosis Association signify by a rising vote their unanimous assent to the election of Dr Minot as their honorary president.

HARVARD UNIVERSITY APPOINTMENTS

Dr Kurt Goldstein, head of the neurophysiological and psychopathological laboratory of the Montefiore Hospital, New York City, has been appointed William James lecturer on philosophy and psychology at Harvard University next year.

Teaching and research staff appointments include the following: Eric G. L. Bywaters, of London, England, research fellow in medicine; Eugene R. Sullivan, of Fall River, Henry P. Walcott Fellow in Clinical Medicine; Adolph L. Saks, of Iowa City, Iowa, research fellow in neurology; Unto U. Uusila, research fellow in physiology and anatomy; Volta R. Hall, Jr., of Cleveland, research fellow in psychiatry; Joseph L. Lewis, of Dorchester, as-

Pediatrics Chairman Dr Warren R. Sisson Instructors Drs Robert H. Aldrich, James M. Baty, Benjamin W. Carey, Jr., Stewart H. Clifford, Louis K. Diamond, R. Cannon Eley, Leroy D. Fothergill, Harold L. Higgins, Henry W. Hudson, Jr., Donald W. MacCollum, Patrick J. Mahoney, Charles F. McKhann, Edwin H. Place, Eli C. Romberg, Clement A. Smith and Conrad Wesselhoeft.

There will be a presentation of cases in the sessions on rheumatic fever and heart disease wherever it is feasible. All courses will be aided by new lantern slides, many of which are in natural color. The faculty have prepared an unusually fine teaching exhibit which should be interesting to every physician.

* * *

The following sessions are arranged for the week beginning February 28

ESSEX SOUTH

Tuesday, March 1, at 4 00 p m., in the Nurses Home of the Salem Hospital, Salem. Subject Early Syphilis. Instructor Rudolph Jacoby. Walter G. Phupen, *Chairman*.

MIDDLESEX EAST

Tuesday, March 1, at 4 00 p m., at the Melrose Hospital, Melrose. Subject Drug Therapy in Pediatrics. Instructor Warren R. Sisson. Joseph H. Fay, *Chairman*.

NORFOLK

Friday, March 4, at 8 30 p m., at the Norwood Hospital, Norwood. Subject Treatment of Burns. Instructor Henry W. Hudson, Jr. Hugo B. C. Rierner, *Chairman*.

NORFOLK SOUTH

Monday, February 28, at 8 30 p m., at the Quincy City Hospital, Quincy. Subject Pneumococcus Pneumonia and Serum Therapy. Instructor Joseph H. Pratt. David L. Belding, *Chairman*.

PLYMOUTH

Tuesday, March 1, at 4 00 p m., in the Rosa Field Nurses Residence, Brockton Hospital (rear of hospital), Brockton. Subject Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor Paul D. White. Walter H. Pulsifer, *Chairman*.

WORCESTER (Milford Section)

Thursday, March 3, at 8 30 p m., in the Nurses' Home of the Milford Hospital, Milford. Subject Septicemia. Instructor Christopher J. Duncan. Joseph Ashkins, *Chairman*.

NEW HAMPSHIRE MEDICAL SOCIETY

NEW HAMPSHIRE HEALTH NOTES

The expansion of health services made possible by social security funds is still in the development period. It is safe to say that the services of every division have increased for the common good, and that new services have been made possible in all divisions.

The Maternal and Child Health Division now has a medical director. Increased personnel has made possible better and more universal service, state wide in scope. The

maternal mortality has reached a new low in 1936, being 481 per 1000 births (urban 605 and rural 320). Maternity centers are conducted in Concord, Berlin, Portsmouth and Goffstown.

The Crippled Children's Division is new in the State Health Department. The 1936 legislature appropriated \$11,000 for this service, which, matched by federal funds, provides for care of crippled children under twenty-one years of age. On the State Register at the end of September, 1937, were listed 1060 children. There is plenty of work to be done in this service and many uses for this appropriation. The State clinic is held at the New Hampshire Memorial Hospital, Concord, the second Thursday of each month, there are an orthopedic surgeon, a neurologist, and a pediatrician in attendance.

SERUM TREATMENT OF PNEUMONIA

It has been announced by Dr. Travis P. Burroughs, secretary of the New Hampshire State Board of Health, that plans are being made concerning pneumonia control throughout the state, especially as regards the providing of free serum. At the present time, the laboratory of the Board of Health in Concord is doing Neufeld typings at any time of the day or night on sputum that is brought to it by messenger. The results are reported immediately, and if the case is treatable, a sufficient quantity of serum is given to the messenger with absolutely no cost.

The only laboratory authorized to do sputum typing for pneumonia and to provide free serum is the State Laboratory at Concord. The reports of typings done at other laboratories are not accepted. However, plans are being made to provide centers all over the state where a competent technician will be present at all times and where serums will be available for the treatable types.

PERSONALS

Dr. Timothy F. Rock, of Nashua, is New Hampshire chairman of Tufts College Medical School campaign. The new sound film, "The Family Doctor," is being shown in various parts of the state under Dr. Rock's direction.

Dr. William M. Prince, formerly university physician at Durham, has opened an office for the general practice of medicine. Dr. W. G. McGregor is temporarily in charge of the university infirmary and Hood House.

Miss Myrtle Flanders, because of poor health, has resigned her position as head of the New Hampshire Chapter of the American Red Cross. Miss Ruth Kernodle will represent the national organization.

Dr. W. J. Paul Dye, of Wolfeboro, has given several lectures on surgical topics before service club and women's organizations during the past four months.

Dr. Elizabeth G. Samoylenko, formerly on the staffs of the Massachusetts General Hospital and the Massachusetts Eye and Ear Infirmary, has opened an office for the practice of urology at Manchester.

Dr. Ludwig Mendelson has opened an office for the practice of surgery and gynecology at Dover.

NOTES

At the annual meeting of the Laconia Hospital Association, Miss Lilian G. Williams, superintendent, reported the most active year in the history of the hospital. Over 2000 inpatients were treated in 1937, with a total income of \$133,903, and expenditures of \$133,360. Over 1400

SUSPENSION OF LICENSE

To the Editor This is to inform you that at the meeting of the Board of Registration in Medicine held February 10, 1938, it was voted to suspend for one month the license of Dr. Edward Fenun, 236 Seaver Street, Dorchester, Massachusetts, because of his testimony in court.

STEPHEN RUSHMORE, M.D., *Secretary*

Board of Registration in Medicine,
State House, Boston.

HEALTH-CONTEST QUESTIONNAIRES

To the Editor The Boston Health Department has recently asked Boston physicians to furnish certain statistical data for use in a health contest conducted by the United States Chamber of Commerce.

The questions to be answered concern chiefly the prophylactic immunizations carried out on children and the obstetrical and genitourinary cases treated privately by individual physicians during the year 1937. The letter accompanying the questionnaire explains that such information will presumably show how well we as a class meet this modern problem of health conservation.

No one will question the wisdom and desirability of such a campaign, but one must wonder at the naïveté with which our health authorities expect such information without having previously given notice that such statistics would be called for.

To quote a very reputable physician who is also a high official in one of our medical societies: While we may keep good records of our individual cases, one rarely keeps separate any record of the number of inoculations or the number of pneumonias. We shall be able to wade through it somehow, but one feels that the information so obtained must of necessity be either grossly exaggerated or just as badly underestimated, according to the mood or memory of the individual supplying the data. By no means can it be called a fair estimate of the actual amount of preventive work done by our private practitioners.

If our health authorities are really interested in such statistics, they should furnish us with the proper charts so that we can keep constant records of such work. In this way desired information could easily be obtained at any time, and it would be both genuine and valuable. The figures so obtained would also show the staggering amount of work really done, and the oft-repeated statement that private practitioners are not interested in preventive medicine would prove to be nonexistent.

RUBIN GURALNICK, M.D.

256 Bennington Street,
East Boston, Mass.

RECENT DEATHS

REARDON—TIMOTHY J. REARDON, M.D., of 76 Commonwealth Avenue, Boston, died February 17. He was in his sixty-sixth year.

Born in Boston, he received his early education in the local schools, later earning his way through Harvard Medical School from which he received his degree in 1894. He spent the next three years at the University of Vienna, following which he spent two years at the Université de Paris and one year in London hospitals.

On his return to Boston, he specialized in diseases of the nose and throat. At one time a trustee of the Boston City Hospital, he was also staff physician at the Carney Hospital and the Boston School for the Deaf at Randolph.

Dr. Reardon was a fellow of the Massachusetts Medical

Society and the American Medical Association. He was a member of the New England Otological and Laryngological Society and the Boston Medical Library.

His two sisters, the Misses Nellie and Mary Reardon, survive him.

HARE—E. TRENN HARE, M.D., of 225 High Street, Holbrook, died February 17. He was in his thirty-sixth year.

A native of Gilbertville, he received his degree from the University of Vermont College of Medicine. He served internships at the Eye and Ear Hospital, Brooklyn, and the Roosevelt Hospital, New York City, after which he opened an office, specializing in eye, ear, nose and throat diseases.

Dr. Hare was a fellow of the Massachusetts Medical Society and a member of the American Medical Association.

MOLLIKA—ZACHARY A. MOLLIKA, M.D., of 48 Prentiss Lane, Belmont, died at sea, January 31. He was in his fiftieth year.

Dr. Mollica received his degree in 1912 from the Medical College of the State of South Carolina. Following his graduation he specialized in surgery.

He was a fellow of the American Medical Association and the Massachusetts Medical Society.

His widow survives him.

NOTICES

BOSTON DISPENSARY

25 Bennet Street, Boston
Lecture Hall, Second Floor, 9-10 a. m.

The Boston Dispensary will hold its next medical conference on Friday morning, February 25.

Dr. John G. Gibson, Jr., will speak on 'Clinical Studies of Blood Volume.' He was invited to address the meeting in place of the previously announced speaker, Dr. Bernard Jacobson.

* * *

MEDICAL CONFERENCE PROGRAM, MARCH, 1938

Tuesday, March 1—Injuries to the Epiphyses. Dr. John D. Adams

Wednesday, March 2—Hospital Case Presentation. Dr. S. J. Thannhauser

Thursday, March 3—Social Instability and the Doctor. Prof. Elton Mayo

Friday, March 4—Mumps. Dr. Conrad Wesselhoeft.

Saturday, March 5—Hospital Case Presentation. Dr. S. J. Thannhauser

Tuesday, March 8—Phlebitis. Dr. Edward A. Edwards

Wednesday, March 9—Hospital Case Presentation. Dr. S. J. Thannhauser

Thursday, March 10—Social Service Case Presentation. Mrs. H. B. Hooker and Miss E. Grundy

Friday, March 11—Some of the Newer Aspects of Colapse Treatment of Pulmonary Tuberculosis. Dr. Richard H. Overholt.

Saturday, March 12—Hospital Case Presentation. Dr. S. J. Thannhauser

Tuesday, March 15—Clinicopathological Conference. Dr. R. C. Wadsworth.

Wednesday, March 16—Hospital Case Presentation. Dr. S. J. Thannhauser

Thursday, March 17—Allergic Manifestations in Certain Dermatoses. Their Recognition and Treatment. Dr. Francis M. Thurmon.

assistant in pediatrics, Henry C Marble, of Boston, assistant in industrial hygiene, William F Dolan, of Arlington, assistant in industrial hygiene, George W Morse, of Brookline, assistant in industrial hygiene, and Philip C Trexler, of South Bend, Indiana, research fellow in bacteriology

CORRESPONDENCE

SERUM TREATMENT OF PNEUMONIA

To the Editor The success of the program being carried on by the Massachusetts Department of Public Health to decrease deaths from pneumonia by use of specific serums is dependent upon encouraging physicians to make use of the facilities at their disposal. One important phase of this matter is making laboratory facilities easily available. A sufficient number of hospitals are co-operating in this plan so that typings can now be done in every part of the State. Many physicians have been making use of the laboratory facilities for typing pneumococci from sputum.

The facilities for isolating pneumococci from the blood stream, on the other hand, have not been so widespread, and such service has been available only in larger hospitals. This shortcoming is being remedied as rapidly as possible. A number of additional laboratories are adding this test to those offered to physicians. The outfits for collecting blood samples can be obtained at the same time as the therapeutic serum. They should be returned to the same laboratory by messenger, since they do not conform to postal regulations and consequently cannot be mailed.

An additional handicap has been that in parts of the State some distance removed from the Bacteriological Laboratory at the State House, patients who have been unable to pay for laboratory work have been dependent upon the generosity of the local hospitals for typing service. A fund has been set up to be used in paying approved laboratories for tests done on such patients. In this way, the burden will be removed from the local laboratories, and physicians will feel much freer to have sputum typings and blood cultures done on indigent patients.

In order to safeguard the expenditures from this fund, regulations in regard to payments from it have been set up by the department. These are as follows:

Payments will be made for typing pneumococci from sputum and blood cultures from persons having, or suspected of having, pneumonia under the following conditions:

- 1 If the tests are done for patients outside the hospital in which the typing laboratory is situated
- 2 If the laboratory requesting payment is approved by this department for doing such tests, if the tests are performed or checked by an approved technician, and if the laboratory certifies that payment for the tests has not been made.
- 3 If the physician when submitting the specimen certifies over his signature that the payment of the charges would be an undue hardship on the patient.
- 4 If the number of examinations on a single patient is reasonable and satisfactory explanation for repeated tests accompanies the bill.

5 If the pneumococcus typing has covered all the types for which typing serum is provided by the department.

6 If the bill is submitted for approval by the 10th of the next succeeding month after the tests are performed.

Item four should not be interpreted as limiting the number of tests to one sputum and one blood culture. Additional sputum samples should be examined on every patient who does not respond promptly to serum therapy. At least one blood culture should be done on every patient. In addition, further specimens should be obtained from those who have shown a previously positive blood culture, or from patients in whom the temperature fails to drop after serum therapy.

HENRY D CHADWICK, M.D.,
Commissioner of Public Health

State House,
Boston.

SUPPORT OF LEGISLATIVE COMMITTEE

To the Editor We now have as chairman of the Committee on State and National Legislation of the Massachusetts Medical Society, Dr Charles Lund, of Boston, who is putting his heart and soul into the work at hand. We in Hampden County have felt that the legislative program cannot be entirely handled at the State House. With this thought in mind, on Saturday night, February 12, the district society invited the senators and representatives from this district to a steak dinner at the Highland Hotel. Along with the legislators we invited our local members who are active in civic and political life, in some cases the family doctor of this or that legislator, and outstanding men whose presence would lend dignity and weight to our cause. Our local president, Dr Allen G Rice, presided, and Dr Lund made a trip from Boston to explain our position on pending bills in which we are interested.

A feeling of respect and confidence was present throughout the evening. The legislators asked many questions and showed an intelligent interest in solving problems as presented for the best interest of the State of Massachusetts. On this ground we are never fearful of the result.

Dr Lund impressed the legislators and the doctors with his sincerity, his intelligence and his fair mindedness, and I am writing this letter to the *Journal* so that the other district societies throughout the State may consider making an effort comparable to ours. We believe that the legislators should understand health problems, and realize that the doctors are really interested in what their elected representatives do. Our opponents are ever on the alert, and we cannot expect legislators to believe very much in the plea of physicians who are strangers to them, when the doctors in their own districts do not take the time to interest themselves in these health measures.

We should very much like to see every county society doing its bit toward a united front. There is no reason why a few should have to do the work for the many.

W A R CHAPIN, M.D.,
Legislative Chairman
Hampden County Medical Society

121 Chestnut Street,
Springfield, Massachusetts.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, FEBRUARY 28

MONDAY FEBRUARY 28

* 15 p. m. New England Heart Association New England Pediatric Hospital

TUESDAY MARCH 1

9-10 a. m. Boston Dispensary Injuries of the Epiphyses. Dr. J. N. Adams

10 a. m. 12:30 p. m. Tumor clinic Boston Dispensary

11:30 a. m. Carney Hospital John T. Bottomley Society Outpatient department

8:30 p. m. Greater Boston Medical Society Beth Israel Hospital auditorium

WEDNESDAY MARCH 2

9-10 a. m. Boston Dispensary Hospital case presentation Dr. S. J. Thannhauser

1 p. m. Clinicopathological conference Children's Hospital Amphitheater

THURSDAY MARCH 3

8:30-9:30 a. m. Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Children's Hospital

*9-10 a. m. Boston Dispensary Social Instability and the Doctor Prof. Elton Mayo

4 p. m. George Washington Gay lecture Tufts College Medical School

5 p. m. Faulkner Hospital clinicopathological conference

FRIDAY MARCH 4

*9-10 a. m. Boston Dispensary Mumps Dr. Conrad Wesselschoft

10 a. m. 12:30 p. m. Tumor clinic Boston Dispensary

12 m. Clinical meeting of the Children's Medical Service Massachusetts General Hospital Ether Dome

SATURDAY MARCH 5

*9-10 a. m. Boston Dispensary Hospital case presentation Dr. S. J. Thannhauser

10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr. Henry A. Christian

SUNDAY MARCH 6

4 p. m. Illustrated public health lecture, Faulkner Hospital auditorium, Chest Operations in the Treatment of Tuberculosis Dr. Harlan F. Newton

4 p. m. Free public lecture, Harvard Medical School amphitheater of Building D Heart Disease Dr. Herman Blumgart

4 p. m. Free public lecture, Beth Israel Hospital Boston in conjunction with the Women's Auxiliary What Can Be Done in Arthritis Dr. Armin Klein

*Open to the medical profession

FEBRUARY 24—Boston Society for the Advancement of Gastroenterology 12 noon Boston City Hospital

FEBRUARY 24—Trudeau Society 8:15 p. m. Beth Israel Hospital auditorium

FEBRUARY 24—Robert B. Brigham Hospital 125 Parker Hill Avenue Boston, at 8:15 p. m.

FEBRUARY 25—Massachusetts Psychiatric Society Page 245 issue of February 3

FEBRUARY 25—Boston Dispensary medical conference Page 367

FEBRUARY 25—New England Pediatric Society Page 368

FEBRUARY 28—New England Heart Association Page 365

MARCH 1—Greater Boston Medical Society Beth Israel Hospital auditorium 8:30 p. m.

MARCH 1—Carney Hospital John T. Bottomley Society Page 368

MARCH 1-31—Boston Dispensary medical conference program Page 367

MARCH 3—George Washington Gay Lecture Page 245 issue of February 3

MARCH 3—Faulkner Hospital Clinicopathological conference Page 365

MARCH 7—Boston University Medical Society Page 368

MARCH 8—Harvard Medical Society Page 368

MARCH 10—Pennacott Association of Physicians Hotel Bartlett 95 Main Street, Haverhill 8:30 p. m.

MARCH 10-11-12—New England Hospital Association Page 51 issue of January 6

MARCH 21—Boston Medical History Club 8:15 p. m. Boston Medical Library

MARCH 28-APRIL 1—Postgraduate Institute of the Philadelphia County Medical Society Page 282 issue of February 10

APRIL 4-8—The American College of Physicians Page 41 issue of July 1

APRIL 26—New England Society of Psychiatry Page 362, issue of February 1

MAY 31-JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

JUNE 15-17—American Medical Association San Francisco

JUNE 15-OCTOBER 5 and NOVEMBER 15—American Board of Ophthalmology Page 365 issue of February 10

OCTOBER 17-21—Clinical Congress of the American College of Surgeons New York City

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p. m. New Bedford

ESSEX SOUTH

MARCH 2—Lynn Hospital Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced

APRIL 6—Gloucester Hospital Gloucester Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced

MAY 5—Censors meet at Salem Hospital 3:30 p. m.

MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p. m. Speaker and subject to be announced

FRANKLIN

Meetings will be held at the Franklin County Hospital Greenfield, at 11 a. m. the second Tuesdays of March and May

HAMPTON

Meetings will be held on the fourth Tuesday in April and July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club, Stoneham at 12:15 p. m. on March 16 and May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27

NORFOLK DISTRICT

MARCH 29—Hotel Kenmore 8:15 p. m. Subject to be announced but to be related to diseases of the kidney Dr. Albert A. Horner

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon

MARCH 3—Norfolk County Hospital South Braintree

APRIL 7—At the Quincy City Hospital

MAY 5—Annual meeting

PLYMOUTH

Meetings will be held at 11 a. m. on March 17 April 21 May 19 and July 21

SUFFOLK

MARCH 15—Joint meeting with Boston Obstetrical Society

WORCESTER

At the following meetings, except the annual meeting dinner will be at 6:15 to be followed by business session and scientific program.

MARCH 9—Memorial Hospital Worcester

APRIL 13—Habermann Hospital Worcester

MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced.

BOOK REVIEWS

The Cerebrospinal Fluid H. Houston Merritt and Frank Fremont-Smith. 333 pp. Philadelphia and London W. B. Saunders Company, 1937 \$5.00

Previous books on the cerebrospinal fluid, as pointed out by Dr. J. B. Ayer in the foreword, are now outmoded, for they were written too early in the history of clinical investigation of the spinal fluid to be able to present accurate correlation between laboratory and clinical findings. This fine book, which originally was started in the Spinal-Fluid Laboratory at the Massachusetts General Hospital and later continued in the laboratory of the Neurological Unit of the Boston City Hospital, is based on the examination of approximately 21,000 spinal fluids from patients whose diagnoses have been verified. The volume consists of a brief historical introduction, excellent chap-

Friday, March 18—Certain Clinical Features of the Natural History of Rheumatic Fever and Heart Disease. Dr T Duckett Jones

Saturday, March 19—Hospital Case Presentation. Dr S J Thannhauser

Tuesday, March 22—X-ray Demonstration. Dr Alice Ettinger

Wednesday, March 23—Hospital Case Presentation. Dr S J Thannhauser

Thursday, March 24—Some Practical Considerations of Muscle Imbalance. Dr Joseph J Skirball.

Friday, March 25—Some Aspects of Pneumonia Therapy. Dr Maxwell Finland

Saturday, March 26—Hospital Case Presentation. Dr S. J Thannhauser

Tuesday, March 29—A Clinical Evaluation of the Blood Sedimentation Rate as a Routine Diagnostic Procedure. Dr Elbert B Agnor

Wednesday, March 30—Hospital Case Presentation. Dr S J Thannhauser

Thursday, March 31—Interesting Clinical Problems from the District Service. Dr Isadore Olef.

RADIO BROADCASTS

The sixth group of weekly broadcasts sponsored by the American Medical Association and the National Broadcasting Company concern public health. These dramatized health messages are intended to furnish supplementary material for health teaching in junior and senior high schools and are broadcast every Wednesday from 2 00 to 2 30 p m over the Red Network. The dates and subjects are as follows:

March 2—Water, Waste and Sanitation. Importance of community control of water supplies, sewage disposal and general sanitary matters.

March 9—Protecting Perishable Foods. What the community can and must do to protect fresh foods such as fish, fruits, vegetables, meats, bakery goods.

March 16—Keeping Books on Health. The meaning and the importance of vital statistics, contagious-disease reporting and community-health records.

March 23—Catching Disease from Animals. Rabbit fever, rabies, undulant fever and similar infections, and what can be done about them.

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen, discussed, and when indicated, treated with radium and high-voltage x-ray.

Physicians are welcome to visit this clinic and bring a patient to the clinic for diagnosis.

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the New England Deaconess Hospital, on Monday, February 28, at 8 15 p m.

PROGRAM

Prognosis of Adult Women with Mitral Stenosis. Dr Burton E. Hamilton.

The Heart in Postoperative Deaths. Dr Shields Warren.

A Case of Congenital Heart Block. Dr William B Stevens and Dr F Gorham Brigham.

Heart Noises. Case report. Dr Frank N Allan.

Cardiovascular Disease in Diabetes. Dr Howard Root.

Selection and Operative Treatment of Hypertension. Dr Elmer C Bartels.

Congestive Failure on Using Digitalis. Dr Lewis Hurxthal.

Interested physicians and medical students are invited to attend.

JAMES M. FAULKNER, M.D., *Secretary*

NEW ENGLAND PEDIATRIC SOCIETY

The regular meeting of the New England Pediatric Society will be held at the Massachusetts General Hospital, on Friday, February 25. The clinical program will begin at 4 30 p m., and the evening meeting at 7 45. Dr Joseph C Aub will speak on 'Endocrine Disorders of Childhood.'

CARNEY HOSPITAL

The John T. Bottomley Society of the Carney Hospital Outpatient Department will hold its regular monthly meeting on Tuesday, March 1, at 11 30 a. m. Dr William E. Browne will speak on 'Important Bony Land Marks and Surface Markings of Various Anatomical Spaces.'

WILLIAM J. MACDONALD, M.D., *Secretary*

THE FAULKNER HOSPITAL

The usual clinicopathological conference will be held at the Faulkner Hospital for its staff and any other interested members of the medical profession on Thursday, March 3, at 5 00 p m.

There will be a discussion of cases by Dr Marshall K. Bartlett and Dr Maurice B. Strauss.

JOHN B. HAZARD, M.D., *Secretary*

BOSTON UNIVERSITY MEDICAL SOCIETY

The next meeting of the Boston University Medical Society will be held in the Evans Memorial Auditorium, 78 East Concord Street, Boston, on Monday, March 7, at 12 o'clock noon.

Dr Morris Fishbein, editor of the *Journal of the American Medical Association* will speak on 'Quacks and Quackery.'

Medical students, nurses and physicians are cordially invited to attend.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, March 8, at 8 15 p m.

PROGRAM

Presentation of Cases.

Exchanges between Cells and Interstitial Fluid. Dr John P. Peters, New Haven, Connecticut.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING
MONDAY, FEBRUARY 28

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FEBRUARY 25—Boston Dispensary medical conference. Page 267.

FEBRUARY 25—New England Pediatric Society. Page 268.

FEBRUARY 25—New England Heart Association. Page 368.

MARCH 1—Greater Boston Medical Society. Beth Israel Hospital auditorium, 8:30 p. m.

MARCH 1—Carney Hospital. John T. Bottomley Society. Page 262.

MARCH 1—Boston Dispensary medical conference program. Page 267.

MARCH 3—George Washington Gay Lecture. Page 245 issue of February 3.

MARCH 3—Faulkner Hospital. Clinicopathological conference. Page 266.

MARCH 3—Boston University Medical Society. Page 269.

MARCH 3—Harvard Medical Society. Page 269.

MARCH 3—Faulkner Association of Physicians. Hotel Barlett, 95 Madison Street, Harvard, 7:30 p. m.

MARCH 11, 12—New England Hospital Association. Page 51 issue of January 6.

MARCH 1—Boston Medical History Club. 8:15 p. m., Boston School of Library

MARCH 3—April 1—Graduate Institute of the Philadelphia County Medical Society. Page 22, issue of February 9.

APRIL 4—The American College of Physicians. Page 41 issue of July 1.

APRIL 5—New England Society of Pediatrics. Page 322, issue of February 1.

MAY 31, JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society. Hotel Bradford Boston.

JUNE 13-17—American Medical Association. San Francisco.

JUNE 13, OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology. Page 287 issue of February 10.

OCTOBER 17-21—Clinical Congress of the American College of Surgeons. New York City.

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p. m. New Bedford

ESSEX SOUTH

MARCH 2—Lynn Hospital. Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced.

APRIL 6—Gloucester Hospital. Gloucester Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced.

MAY 5—Censors meet at Salem Hospital. 3:30 p. m.

MAY 11—Annual meeting. Salem Country Club. Peabody. Dinner at 7 p. m. Speaker and subject to be announced.

FRANKLIN

Meetings will be held at the Franklin County Hospital. Greenfield at 11 a. m. the second Tuesdays of March and May.

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July.

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club. Stoneham, at 12:15 p. m. on March 16 and May 11.

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club. Lowell on April 27.

NORFOLK DISTRICT

MARCH 29—Hotel Kenmore. 8:15 p. m. Subject to be announced but to be related to diseases of the kidney. Dr. Albert A. Horner.

MAY—Annual meeting.

The censors meet on the first Thursdays of May and November in each year.

NORFOLK SOUTH

Meetings held at 12 noon.

MARCH 3—Norfolk County Hospital. South Braintree.

APRIL 7—At the Quincy City Hospital.

MAY 5—Annual meeting.

PLYMOUTH

Meetings will be held at 11 a. m. on March 17, April 21, May 19 and July 21.

SUFFOLK

MARCH 15—Joint meeting with Boston Obstetrical Society.

WORCESTER

At the following meetings, except the annual meeting, dinner will be at 6:15 to be followed by business session and scientific program.

MARCH 9—Memorial Hospital, Worcester.

APRIL 13—Hahemann Hospital, Worcester.

MAY 11—Afternoon and evening annual meeting. Place and schedule of program to be announced.

BOOK REVIEWS

The Cerebrospinal Fluid. H. Houston Merritt and Frank Fremont-Smith. 333 pp. Philadelphia and London W. B. Saunders Company, 1937. \$5.00.

Previous books on the cerebrospinal fluid, as pointed out by Dr. J. B. Ayer in the foreword, are now outmoded, for they were written too early in the history of clinical investigation or the spinal fluid to be able to present accurate correlation between laboratory and clinical findings. This fine book, which originally was started in the Spinal-Fluid Laboratory at the Massachusetts General Hospital and later continued in the laboratory of the Neurological Unit of the Boston City Hospital, is based on the examination of approximately 21,000 spinal fluids from patients whose diagnoses have been verified. The volume consists of a brief historical introduction, excellent chap-

ters on the anatomy and physiology of the cerebrospinal fluid, its chemistry and pathologic physiology, the technic of lumbar puncture, the cerebrospinal fluid syndromes and methods of laboratory examination, and an extensive bibliography and index. The volume is illustrated by numerous charts and tables. The subject is covered very completely, and the volume will become an essential part of the equipment of any first-class laboratory or hospital, as well as an important addition to the library of all medical practitioners.

In turning over the pages, it is interesting to note that the authors hold the view, now almost universally accepted, that the choroid plexus is the site of origin of the spinal fluid, that its exit from the ventricles is through the foramina of Luschka, and that the supposed foramen in the midline of the fourth ventricle, as described by Magendie, is probably not a functional opening, and that the evidence favors Mestrezats theory that the cerebrospinal fluid is a dialysate. The function of the spinal fluid is probably a mechanical one, as described by Magendie in 1842. Puzzling points, which have often bothered practitioners, are explained. It has been erroneously claimed that the irritation of a simple lumbar puncture may cause meningeal reaction, which is manifested by a pleocytosis at a subsequent puncture. The authors found no evidence of such a reaction. They have devised a technic by which bloody fluid obtained at lumbar puncture as the result of imperfect withdrawal may be evaluated so that the actual white-cell count and protein may be estimated. They have not found any treatment efficient in post lumbar puncture headache, except the postural one of keeping the patient in a horizontal position. They point out that the colloidal gold reaction is no longer thought to be diagnostic of any particular disease of the central nervous system, but is simply an indication of an abnormality of the protein content of the fluid. For this reason they have wisely discarded the prejudicial terms 'paretic', 'syphilitic' and 'meningitic' curves and have replaced them by the terms 'first zone', 'midzone' and 'end zone' curves.

The value of this book lies in the accumulated and carefully analyzed data from a large series of cerebrospinal fluids, and all the syndromes as seen in various diseases—material that has never been adequately presented to the medical profession before. Except for the reduction in the size of some of the charts, which has resulted in making them difficult to read, the reviewer has no criticism of this outstanding publication.

Not So Long Ago. A chronicle of medicine and doctors in colonial Philadelphia. Cecil K. Drinker. 183 pp. New York: Oxford University Press, 1937. \$3.50.

In Philadelphia, back in 1758, the young matron Elizabeth Drinker began keeping a diary, and a diarist she continued to be almost to the end of her days in 1807. Now comes her great great-grandson to comb her journals for matters of medical interest and to make those matters into a book.

It was a rich lode which he struck. Elizabeth Drinker had nine children and twenty-five grandchildren, and the medical experiences of this numerous progeny and those of her husband, her servants and her neighbors were among her most pressing concerns all her life. The Drinkers were well-to-do folk and in her various and frequent exigencies she could command the best medical advice the times had to offer. Benjamin Rush, William Shippen, Adam Kuhn, Philip Syng Physick and John Bard—prominent names all in American medical history—appear repeatedly in her pages.

Yet these men, able, hard working and conscientious

as they were, could do but little (one sees now) to lessen the medical hazards that then beset life. Strong in system and theory they really possessed but a minimum of fundamental knowledge." Even in Philadelphia, the largest and perhaps richest city in the colonies, there was no sanitation, hospital facilities were vastly inadequate, and what with typhoid, smallpox, dysenteries, yellow fever and other epidemic diseases there was a heavy mortality among the youthful. Of Elizabeth Drinker's nine children only five lived to maturity and one of these was for years in a precarious state from tuberculosis.

Very wisely Dr. Drinker groups his quotations according to subject rather than chronology. Thus one finds chapters on childbearing in 1790, on the tuberculosis of William Drinker, on smallpox and the fevers, on yellow fever in Philadelphia, and on medical practice in 1800. His own part in the exegesis is to supply the backgrounds and the broad settings, to introduce the people, to furnish the continuity, and on occasion judiciously to comment. But particular events are presented always through the eyes of his ancestors.

Viewed as a whole the book is a notable contribution to social as well as to medical history. It leaves one with a vivid sense of the life of a period, of what people must needs then endure of fleshly ailments, and of what vast strides medicine has taken since that time—after all not so long ago. No one who is interested in the development of American medicine can afford to pass it by. Indeed, one might suppose that the layman would enjoy it almost as much as the physician. Dr. Drinker is to be heartily congratulated on his achievement.

Modern Treatment in General Practice Volume 3. Edited by Cecil P. G. Wakeley. 436 pp. Baltimore: William Wood & Company, 1937. \$4.00.

This is the third volume of selected papers reprinted from current issues of *The Medical Press and Circular* of London, England. The subjects are chosen with particular reference to the needs of general practitioners in that they deal primarily with diagnosis and treatment. They have been written by surgeons and physicians representing a fair cross section of skilled British practice.

There are fifty-one chapters, each one devoted to a special subject. Of this number six are allotted to cancer in various situations, eight to different problems in the realm of psychiatry, psychology, behaviorism and several organic, central nervous-system diseases, such as sclerosis (disseminated), general paresis, epilepsy and cerebral syphilis. For the other subjects there are excellent discussions of intestinal obstruction, colitis, anal fistula, gastric and duodenal ulcers, esophageal obstruction, congenital dislocation of the hip, infantile paralysis, injuries to the wrist, harelip, injection treatment of varicose veins, industrial injuries to the hand and foot, and fractures of the pelvis and complications, treatment of edema, chorea, cirrhosis of the liver, cardiac failure, cholecystitis, acute rheumatism, prostatic enlargement, osteoarthritis, essential hypertension, hyperchromic anemia, chronic bronchitis and asthma, ophthalmic emergencies, traumatic abdominal emergencies and pulmonary suppuration, value of blood examinations to the general practitioner, tumors of pituitary gland, treatment of ringworm of the foot, tuberculosis of the skin, acute pyelitis, histidine treatment of peptic ulcer, and treatment of angina pectoris, the modern treatment of dysentery and dietetic essentials for the general practitioner. The above is nothing more than the table of contents. It would be impossible to give space to a detailed review of each article, but suffice it to say that they are written uniformly well and present modern English opinion in a clear-cut, practical manner.

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LATE RESULTS FOLLOWING THE USE OF INSULIN IN ONE HUNDRED CASES OF MALNUTRITION

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BOSTON

THE use of insulin in producing a rapid gain in weight in patients with nondiabetic malnutrition has been well established¹. Since its introduction for this purpose an extensive literature on the subject has been gathered, in general immediate improvement with this form of therapy has been obtained. Practically nothing, however, has been written concerning the course of these patients after the discontinuance of insulin. It has seemed of value to follow a group of these patients for a considerable period, and to observe what changes had taken place in the weight, the general condition and the carbohydrate tolerance after discontinuance. This paper reports a follow-up study of 100 patients with nondiabetic malnutrition who had gained weight with insulin treatment, and who were observed for from one to six years after its cessation.

CLINICAL MATERIAL

Fifty-four women and 46 men were studied. All were ambulatory and normal physically except for from moderate to severe malnutrition. Their ages ranged from eighteen to seventy-one. Practically all of them had been underweight for years, and their best weights in most instances were no more than they had been when insulin was started. All had tried to gain weight by one method or another, but without success. The majority were constitutionally asthenic and were nervous, apprehensive, easily fatigued, lacking in energy and dyspeptic, some, however, were of the thin type who ate and felt well. The urine in all patients was normal, and the blood-sugar concentration, as determined in many instances before starting insulin therapy, was within normal limits.

The patients ordinarily injected 10 units of insulin three times a day about twenty minutes before meals. A few took insulin twice a day, and in rare instances the dose was increased to 20 units two or three times a day. The insulin was usually

taken for from one to three months, the shortest period being two weeks and the longest seven months. A liberal diet was advised.

IMMEDIATE RESULTS WITH INSULIN

The immediate effects of insulin therapy were a gain in weight and an improvement in appetite, which varied in individual patients. In most cases the gain was from 3 to 4 lb per week for the first two or three weeks, it became less marked as time progressed. Finally, the weight remained constant regardless of the administration of insulin. The greatest increase in any patient in one week was 9 lb. Most of the group noted an improved general and mental condition, an increase in strength and efficiency and a better gastrointestinal function. The gain in weight appeared to be due to an actual increase in the deposit of fat and not to edema. This was suggested by the measuring of the fluid intake and output in 11 patients.

Table 1 *Gain in Weight in 100 Thin Patients during Insulin Therapy*

NO. OF CASES	PERIOD OF TREATMENT	GAIN IN WEIGHT lb	AVERAGE GAIN IN WEIGHT lb
6	2 wk.	3-8	6
13	3	5-16	8
22	4-5	4-22	10
14	6-7	5-24	14
10	2 mo.	9-19	15
16	2½	8-19	14
15	3-4	8-31	15
4	6-7	16-25	20

during and after insulin therapy, the relation between them being practically unchanged. In 1 case during insulin treatment² repeated biopsies of the abdominal wall showed a remarkable increase in the size of fat cells and in the depth of the subcutaneous fat. The weight gained during various periods of insulin therapy is given in Table 1.

WEIGHT AFTER OMITTING INSULIN

The weight of patients in this group was noted during periods which ranged from one to six years after the cessation of insulin treatment. The pa-

tients were observed as follows 26 for one year, 12 for two years, 19 for three years and 43 for from four to six years The results are given in Table 2

Table 2 *Duration of Added Weight in 100 Patients after Discontinuing Insulin*

NO OF CASES	FOLLOW UP PERIOD	NO OF CASES RETAINING ALL GAINED WEIGHT	NO OF CASES LOSING WEIGHT
26	1 yr	17	6 lost all within 1 year 3 lost most of gain in 1 year
12	2	5	3 lost all in a few months 4 held weight 1 yr then lost gradually
19	3	11	4 lost all in 6 mo 4 kept weight 1 yr then lost gradually
43	4-6	26	10 held weight from 1 to 2 yr then lost gradually 7 retained about half of added weight

Of the 26 patients observed for one year after discontinuing insulin, 17 retained the added weight, 6 lost it all and 3 maintained less than half the gained weight Of the 12 patients followed for two years, 5 maintained the gain, 3 lost the added weight shortly after discontinuing insulin and 4 held the weight for approximately a year and then lost it gradually during the subsequent year Of the 19 patients followed for three years, 11 maintained the gained weight, 4 lost it all within six months and 4 kept the weight for approximately one year and then lost it slowly over varying periods of time Of the 43 patients followed for from four to six years, 26 held the added weight, 10 maintained the gain for from one to two years and then lost during varying intervals of time and 7 retained about one half the gained weight

The majority of the patients have maintained the increased weight during the various follow-up periods and have felt better because of it These results are in striking contrast to those obtained by Nichol,³ who in following 42 patients who gained weight with insulin found that 31 maintained their gain for six months or less, and only 4 kept the weight for three or four years The chief cause for these different results may possibly be the difference between the climate of southern Florida and that of this part of the country Also, some of Nichol's patients had organic disease

It was difficult to predict which patients would retain and which would lose the added weight In general, those who gained the most weight were the most likely to retain it This was not an invariable rule, because some of those who made lesser gains maintained the weight, whereas others who made greater gains lost it all Some patients continued to feel better in spite of a loss in weight after discontinuing insulin

The chief causes for the loss of weight after cessation of insulin treatment were unhappy love affairs, poor economic conditions and disagreeable occupations Other losses were due to acute in-

fections, "nervousness" and serious family illness. Some patients who were students lost because of irregular intake of food and worry over examinations

The best results obtained with insulin may be illustrated by citing briefly the case of a doctor aged sixty-three who was having marital difficulty He became very nervous, depressed and weak, was unable to eat and lost 35 lb in about two months He took 10 units of insulin three times a day before meals for five weeks and put on 22 lb, and began to improve generally in spite of persistent marital trouble During the subsequent year he gained an additional 9 lb At the end of two years his weight was constant, he felt much better, and said that if it were not for insulin he would not be alive

Ten of the patients, listed as maintaining their added weight, continued to gain after discontinuing insulin The results of these cases are given in Table 3 Apparently there was very little danger of obesity's developing after discontinuing insulin Although 4 patients became from 10 to 35 lb overweight for their age, height and sex, one of them became definitely obese

Table 3 *Record of Ten Patients Who Gained after Discontinuing Insulin*

NO OF CASES	WEIGHT GAINED ON INSULIN	WEIGHT GAINED AFTER STOPPING INSULIN	PERIOD OF GAIN	COMMENT ON WEIGHT
	lb	lb		
2	10-15	5	1/2 3 yr	Gradual gain
3	6-12	6-7	3-4	Same for past 6 mo
2	11-31	13-16	4-5	Constant for last year
2	22-24	9-18	1	Same for past 1 1/2 yr
1	15	54	4	Gradual gain.

CARBOHYDRATE TOLERANCE

In a previous study I made some observations⁴ on the sugar tolerance in 25 thin patients who gained weight with insulin, and found a temporary decrease in the glucose tolerance in certain cases during the period of insulin treatment However, the sugar tolerance returned to normal shortly after the insulin was discontinued Later Odin⁵ made similar observations in subjecting habitually thin patients to fattening treatment with insulin, he also noted in certain cases a decreased carbohydrate tolerance, attended by an increased blood sugar curve and excretion of sugar in the urine during the dextrose-tolerance test Recently Dusik,⁶ working with Sakel on the insulin-shock treatment of schizophrenia, informed me that glycosuria appeared before breakfast in some cases on the morning following insulin treatment Occasionally a high blood sugar occurred in the afternoon after glucose had been administered for the insulin shock Shortly after treatment was stopped the blood sugar and urine became normal

It seemed important to observe more particularly the effect of insulin on the carbohydrate metabolism in a large group of such persons, and to determine whether any abnormal changes developed after a considerable period of time had elapsed after discontinuing insulin. This work was carried out by testing the urine and blood for sugar in fasting and non fasting specimens at varying intervals of time during the periods of observation, which ranged from one to six years after the cessation of insulin treatment.

The urine was examined in most of the 100 patients seen a year after discontinuing insulin, and also in a majority of those followed at the end of two or three years. In no case was there any glycosuria. The blood sugar also was determined in many cases at the end of one year and in an occasional case after two or three years. These values also were normal, and the figures are therefore not given. Finally, nearly all the patients followed for from four to six years had urine examinations, while in 11 the blood sugar was determined at the end of the follow-up period. These results, too, were perfectly normal. In no case did albuminuria develop as the result of insulin.

INSULIN HYPERSENSITIVENESS

Local skin reactions appeared at the site of insulin injections in 31 per cent of the cases. These were characterized by a somewhat indurated and slightly tender lump with a superficial erythema from 3 to 5 cm in diameter. This hypersensitivity ordinarily started from seven to ten days after the beginning of insulin treatment, and disappeared after varying intervals of time, usually in several weeks. In 3 cases there was a mild urticaria, which necessitated the stopping of insulin in 1 patient who was unusually sensitive to a number of proteins.

One patient was of unusual interest in this relation. She took insulin five and a half years ago for three months without having insulin sensitivity. During the intervening period she lost the gained weight and resumed insulin seven months ago. After two weeks of insulin treatment she developed giant urticaria from the top of her head to the tip of her toes about a half hour after taking an injection of insulin. The insulin was omitted for several days, and after resuming it the hives reappeared. Apparently this patient developed a sensitivity to insulin.

DISCUSSION

Most doctors have encountered extremely thin nondiabetic patients in whom there had been considerable difficulty in improving the state of nutrition with such measures as diet, tonics, rest and vacations. Insulin has become a very useful thera-

peutic adjunct in the management of such cases where the ordinary methods have been unsuccessful. Along with the gain in weight, insulin improved the nervous state, the general condition and the vigor of many patients. It is of special interest that most of the patients have maintained the added weight and the better general condition for as long as six years after the cessation of insulin treatment. It appeared quite likely that a number of those patients who lost the gained weight would have retained all or part of it had it not been for the various complicating factors which arose during the follow-up periods. Insulin was of temporary benefit, at least in those who did not retain the weight permanently.

In estimating the value of any therapeutic agent it is important to ascertain whether any harmful temporary or permanent effects may result from it. In this connection, the only point requiring mention is the temporary decrease in the sugar tolerance which was found in some cases during the period of insulin administration. This was apparently of no practical importance, since the tolerance returned to normal in a short while. In order to prove that the impaired carbohydrate tolerance was not permanent, tests for sugar in the blood and urine were made in the cases examined at intervals up to six years after the discontinuance of insulin, all were found to be normal.

SUMMARY

A study is presented of the late results obtained in 100 thin individuals, without organic disease, who gained weight with insulin and who were observed for from one to six years after the cessation of insulin therapy.

The immediate effects of insulin treatment were a gain in weight, a better appetite and an improvement in general condition, all these varied according to the individual patient.

The majority of the patients maintained the added weight and the improved general condition for as long as six years after discontinuing insulin, and a few continued to gain, but one became definitely obese. Insulin induced at least a temporary improvement in those who did not retain the weight. Various complicating factors were adequate causes for the loss of the gained weight in a number of cases.

In some patients there was a decrease in the sugar tolerance during the period of insulin treatment, but this returned to normal shortly after discontinuing insulin. There was no permanent impairment of the carbohydrate tolerance.

Insulin has become a valuable therapeutic adjunct in the management of certain patients with nondiabetic malnutrition who have had difficulty

in gaining with the ordinary methods of treatment

189 Bay State Road

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PERNICIOUS ANEMIA DUE TO ENTEROENTEROSTOMY

Report of a Case Cured by Reoperation

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BOSTON

FABER in 1897 reported cases of pernicious anemia apparently due to chronic obstruction of the small bowel. Meulengracht¹ collected 22 such cases. Not all these are reported in detail, but several had fecal fistulas. Most of the cases had obstruction in the lower ileum with dilatation above, and the majority had achlorhydria. One of Meulengracht's patients was cured by operation, and the only one treated with liver was entirely relieved by its use.

In the case reported by Little, Zervas and Trusler,² lateral bowel anastomosis was performed twice, pernicious anemia appeared several years later. The anastomosis was undone and 24 cm. of jejunum was excised. Gastric analysis showed the presence of free hydrochloric acid. The patient made a prompt response to liver extract, but had a recurrence of anemia when the liver was omitted.

Strauss³ mentions 2 cases of pernicious anemia following secondary short-circuiting operations after appendectomy, one in a boy eight years old. Taylor⁴ has reported a case with intestinal diverticulosis, pernicious anemia and bilateral supraceliac apoplexy. Sturgis⁵ mentions a case of pernicious anemia, apparently dependent upon an anastomosis of the jejunum to the transverse colon, which was relieved by the administration of liver extract intramuscularly. Butt and Watkins,⁶ like other observers, have found blood pictures suggesting pernicious anemia in a variety of conditions in which there is severe disorder of the lower intestinal tract, such as regional ileitis, carcinoma of the ileum or cecum, diverticulosis of the colon and multiple fecal fistulas of the small intestine.

Nutritional disturbances after such operations are fairly common, but very few (Meulengracht,¹ Case 2) in which complete relief has been obtained

by reoperation have been reported. It seems worthwhile, therefore, to report another case of pernicious anemia apparently cured by restoring to normal a short-circuited bowel.

CASE REPORT

A 30-year-old man, an instructor in a university, was first seen in February, 1933. In June, 1930, he had been operated on for acute appendicitis. One month later, for symptoms not clearly defined by the patient, he was again operated upon, an enteroenterostomy was done. It was said that the lower 180 cm. of ileum was short-circuited.

Following this operation, the patient developed a severe diarrhea and regained strength very slowly. In the spring of 1932 he was given liver extract by mouth and felt well in the summer, but this treatment was not continued. The following autumn he became anemic, felt tired and weak, and suffered from diarrhea, with three or four loose, light-colored stools daily. There was no soreness of the tongue, and only slight numbness of the fingers of the right hand.

The family history was unimportant. There was no familial premature graying of the hair, but rather a tendency to baldness; there was no familial jaundice or anemia.

The only important illness was rheumatic fever at the age of eight years. There had been no weight loss and no dietary idiosyncrasies.

At physical examination in February, 1933, the sclerae were definitely icteric, the heart was slightly enlarged, with definite but slight mitral stenotic and aortic regurgitant murmurs. The blood pressure was 120/50. The tongue appeared normal. Neither the liver nor spleen could be felt. The knee jerks were normal. Vibration sense was normal over the tibiae. The urine was highly colored but contained no bile. The red-blood-cell count was 2,900,000. The hemoglobin was 60 per cent (Tallqvist) and the white-cell count 5700, with 74 per cent polymorphonuclears, 21 per cent lymphocytes, 2 per cent monocytes and 3 per cent eosinophils. The average size of the red cells seemed definitely increased, there being many true macrocytes. There were also many small and fragmented forms. The cells were well filled with hemoglobin, and young red cells were few in number. The platelets occurred in approximately normal numbers.

The course of the illness is shown in Chart 1. For a time the patient did well on a water extract of liver (Valentine's E-29), but larger and larger doses were required to maintain the red-cell level at or near the 5,000,000

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mark. The diarrhea never entirely cleared up but at no time were there neurological symptoms.

From November, 1934, to March, 1935, there was transient soreness and desquamation of the tongue. Finally liver by mouth failed to maintain the red-cell level, and liver extract given intramuscularly was resorted to. As much as 6 cc. of Lederle's liver extract, derived from 200 gm. of liver, was needed each week to keep the count normal.

In May, 1935, the patient entered the Baker Memorial of the Massachusetts General Hospital for further study with a view to considering operative procedures. The fragility test of the red blood cells was normal, hemolysis beginning in 0.44 per cent salt solution and becoming complete in 0.30. The icteric index was 60, and the

The patient was last seen on July 29, 1937, when he stated that he was feeling entirely well and had no symptoms of any kind. Examination was entirely negative except for the heart murmurs mentioned above. The red blood-cell count was 5,690,000 and the hemoglobin 90 per cent (Tallqvist). The blood smear showed no abnormal variation either in size or in shape of the red cells; the differential count of the white cells was normal.

COMMENT

This case is reported as one of pernicious anemia that was secondary to enteroenterostomy, and was entirely cured by restoring the bowel to its normal state.

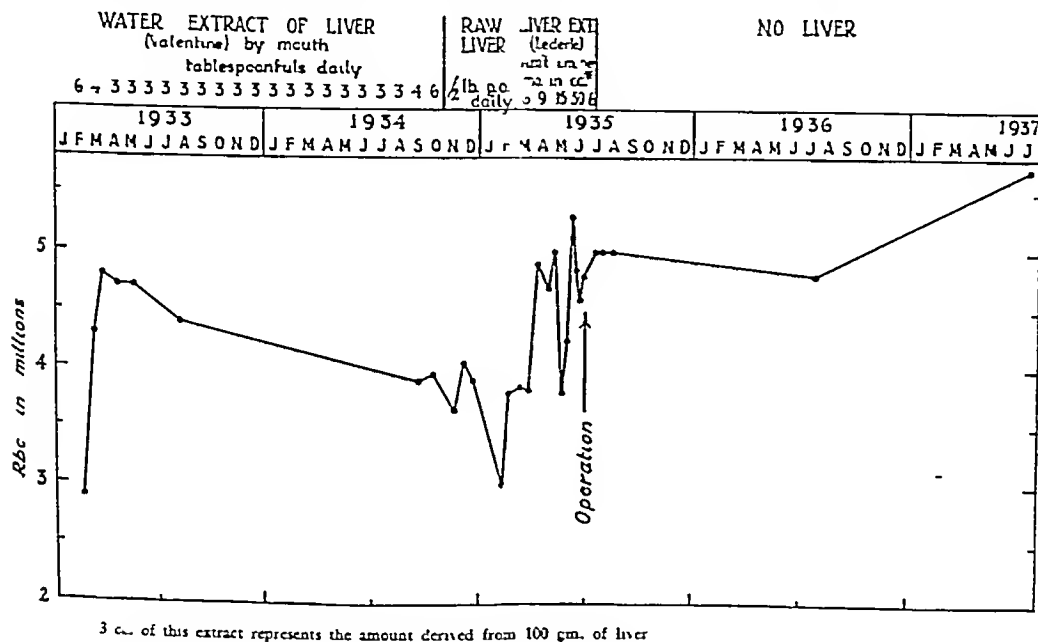


Chart 1 Pernicious anemia due to enteroenterostomy and cured by reoperation

van den Bergh 10 mg per cent. Gastric analysis showed 28 units of free hydrochloric acid after an alcohol test meal, without histamine. The red-blood-cell count at this time was 3,800,000 and the reticulocytes 1.9 per cent. A ray examination with barium showed an anastomosis of what was thought to be the jejunum with the ascending colon. Operation was decided upon.

With massive doses of liver the red blood-cell count rose to 4,800,000. On July 1, 1935, Dr. Arthur W. Allen operated and found about half the small bowel short circuited. The lower half of the small bowel was tied up in a mass of adhesions. Starting from the ileocecal valve, the adhesions were freed until the anastomosis was reached; the latter was then undone and continuity was restored. The patient made a good convalescence. On July 8, he received an intramuscular injection of 6 cc. of Lederle's liver extract, derived from 200 gm. of liver. Two weeks later the red-blood-cell count was 5,000,000, the icteric index 7, and the van den Bergh too low to read.

Ever since then the patient has remained well, with no diarrhea, and has had a great amount of energy. On August 5, 1935, his red-blood-cell count was 5,000,000, there was only one formed stool daily, his appetite was ravenous, and he was able to do a vast amount of work. On July 19, 1936, the red-blood-cell count was 4,800,000.

In regard to the cause of the anemia, it seems easy to postulate improper absorption of the specific substance necessary for the maturation of red-blood cells, according to Castle's theory. Not only might the short-circuiting of at least half of the small bowel account for such a lack, but also the very rapid intestinal rate obviously present in this case would contribute to it. It is difficult, however, to explain the fairly severe degree of icterus in association with a relatively mild degree of anemia or to account for the very rapid drop in the red-cell level on this basis alone. Except for the absence of evidence of very active red-cell regeneration, the picture suggests a hemolytic type of anemia. There is very little evidence of disturbance in liver function, but one cannot help suspecting that the liver was somehow involved. Such questions might be further clarified if liver function tests could be done at the height of the anemia, and compared with tests performed after operative cure had been established.

In any case, short-circuiting operations, which may be life-saving procedures, should be done with caution, using the smallest length of loop possible, and having in mind a possible secondary operation in an attempt to restore normal function to the bowel.

SUMMARY

A case of pernicious anemia, resulting from enteroenterostomy and cured by operative restoration of the normal bowel state, is reported.

264 Beacon Street.

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ACUTE PANCREATITIS

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AT THE meeting of the New England Surgical Society in 1927 papers were presented by Watkins and Hunt in which the clinical experience with acute pancreatitis at Worcester City Hospital was analyzed. Their reports showed an immediate mortality of 50 per cent in the series of 18 cases. In the same year Schmieden and Sebening from a canvass of a hundred clinics compiled results in 1278 cases treated operatively, including 38 of their own. For the entire group the mortality was 51.2 per cent. In numerous other reports both prior to and about that time mortality rates of from 40 to 60 per cent were the rule. Happily, some recent reports show a downward tendency, whether due to better handling or to more success in recognizing milder cases is not wholly clear. In 1933 Finney was able to report a series of 32 cases with a gross mortality of but 37 per cent.

ETIOLOGY

Since Opie's work early in the century, Flexner and a number of other investigators have described the effects of injecting bile and a host of other irritating substances into the pancreatic ducts. Gastric juice, duodenal contents, dilute acids, alkalis, oils, soaps and diphtheria toxin have one feature in common: if they are injected into the duct of Wirsung with enough pressure, an acute hemorrhagic pancreatitis will result. Schmieden and Sebening, writing from the clinic at Frankfurt, Germany, have warned us that many of the minor traumas which a pancreas may receive while the abdomen is open may be sufficient to instigate a full-blown acute hemorrhagic pancreatitis. They cite as an

example a case demonstrated by Walzel in which, during a transduodenal choledochotomy, pancreatic necrosis followed the introduction of a sound through the ampulla of Vater. In this instance the duct of Wirsung was accidentally invaded. The occlusion of the pancreatic duct by ascariis is enough to initiate this disease, and over 50 such cases are reported in the literature. These same writers point out that a mere puncture or biopsy of the gland has been followed by a similar event.

In view of these sound clinical observations that acute pancreatitis may follow mechanical obstruction or some trauma which allows an extravasation of trypsin into the interstitial tissue, it seems hardly necessary to presuppose, as the etiologic factor for all cases, the regurgitation into the pancreatic ducts of one of the digestive juices. So far as has been determined, infection plays even a lesser role in the production of the disease.

Opie was one of the first to demonstrate a small calculus behind the ampulla which effectively occluded the outlet to the bowel and converted the common duct and duct of Wirsung into a common channel. A number of similar cases have been found in subsequent autopsies, but they are not numerous enough to explain more than a small percentage of the cases. It seems reasonable to suppose that any factor that will suddenly and effectively block the exit of the pancreatic juices so that the duct-acinar system ruptures at the moment of active secretion, will allow the active ferments to escape into the interstitial tissues, and will initiate the chain of events that characterizes hemorrhagic pancreatitis. No work has brought this out more effectively than the scholarly paper of Rich and Duff, published early in 1936, in which they demonstrated to their own satisfaction that certain cases of acute hemorrhagic pancreatitis

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followed the partial or complete obstruction of the ducts by a metaplasia of the lining epithelium

PATHOLOGY

In this disease the pancreas may present a picture varying from edema and interstitial hemorrhage to marked necrosis with free hemorrhagic gangrene and later sequestration of the entire gland. Chemical peritonitis, suppuration, agglutinative adhesion and formation of cysts may follow if the patient survives the initial disaster. Fortunately for the surgeon, there are several signposts which at operation suggest the need for exploring the lesser omental sac in order to confirm or establish the diagnosis.

On opening the peritoneum there is characteristically an escape of serosanguineous fluid. The presence of fat necroses is usually pathognomonic. These little white areas are usually found in the early stages around the foramen of Winslow and the root of the mesentery. The large and small bowels are uniformly dilated.

Division of the gastrocolic omentum usually reveals more fat necrosis in the lesser omental sac, together with an edematous and darkly mottled pancreas. If the destruction is extensive, parts of the organ may be gangrenous, with multiple hemorrhagic areas beneath the peritoneum which covers the gland. The amount of fluid retained in the lesser sac depends upon the patency of the foramen of Winslow.

Finney reported a series of cases in which a serosanguineous exudate was found in 53 per cent. This was found in 57 per cent of our cases. Finney reported fat necrosis in 76 per cent, while in our cases 71 per cent showed this lesion.

All writers on the subject have emphasized the frequency of associated gall bladder disease (Table 1). Opie brought out, and experience has proved,

Table 1 *Data on Cases of Acute Hemorrhagic Pancreatitis as Reported by Various Authorities*

	OUR SERIES (14 cases)	SCHMIEDEN AND SEBENING (1778 cases)	FINNEY (37 cases)	MC WHIR TER	ECOWILL (105 cases)
Mortality	14.3	51.2	37.7	53†	42
Associated gall bladder disease	57	69.8	—	55	42
Serosanguineous exudate	57	—	57	—	—
Fat necrosis	71	—	76	—	—

Type of operation: abdominal drainage 33% gall bladder drainage 50%
Type of operation: abdominal drainage 77% gall bladder drainage 11%
Type of operation: abdominal drainage 77% gall bladder drainage 11%
Type of operation: abdominal drainage 77% gall bladder drainage 11%

that in cases of acute pancreatitis the biliary tract is frequently diseased, although grossly it appears normal to the surgeon at operation. This is

thought by some to be reason enough to drain the gall bladder, even when no stones are palpable. Against this procedure must be set the possibility that infection may be introduced by cholecystostomy, necessitating a subsequent cholecystectomy. One of us saw a normal gall bladder drained for pancreatitis several years ago, where such a sequence of events occurred.

In our series there were 6 cases, or 43 per cent, in which at operations and at one autopsy no gallstones or other evidence of disease of gall bladder or ducts could be found (Table 2). In general

Table 2 *Associated Lesions of Biliary Tract in This Series of Cases*

CASE NO.	TYPE OF PANCREATITIS	CONDITION OF BILIARY TRACT
1	Acute hemorrhagic fulminating	Stones in gall bladder — one in ampulla
2	Subacute exudative	Stone in gall bladder
3	Subacute	Stone in gall bladder
4	Acute hemorrhagic	Negative
5	Acute hemorrhagic	Stone impacted in common duct
6	Acute hemorrhagic	Apparently normal
7	Acute hemorrhagic	Many stones in gall bladder
8	Acute hemorrhagic (severe hemorrhagic)	Negative
9	Subacute hemorrhagic	Negative
10	Acute hemorrhagic	Many stones in gall bladder
11	Acute hemorrhagic	Two stones in gall bladder
12	Acute hemorrhagic	Many stones in gall bladder
13	Acute hemorrhagic	Negative
14	Acute with necrosis	Negative (postmortem)

even the hard-and-fast advocates of the biliary-tract origin of acute hemorrhagic pancreatitis admit a 20 per cent deficit in its observed relation.

In this connection, the paper by Rich and Duff above referred to deserves more than passing mention. They have been bold enough to launch a new idea and support it by arguments and experimental evidence which are persuasive if not entirely convincing. Their conception rests upon the following three factors, which they feel are demonstrable and trustworthy:

(1) The essential condition to the initiation of the acute hemorrhagic episode is obstruction to some part of the duct-acinar system, with rupture from back pressure of the products of the gland's own secretory power.

(2) A constant and specific vascular lesion, characterized by a rapid necrosis of the walls of arteries and veins, is uniformly found in both the human and the experimental cases of acute pancreatitis. To prove this contention, Rich and Duff injected purified trypsin subcutaneously and produced this vascular necrosis, bile and duodenal contents when injected in a similar manner failed to duplicate the lesion.

(3) A newly discovered lesion of the lining epithelium is a cause of duct obstruction. This lesion consists of a metaplasia of the duct epithelium into nodules of stratified cells tending toward the squamous-cell type. Its discovery as a possible cause of obstruction is attributed to Priesel in 1922, and association of the lesion with cysts, lipomatosis and necrotic foci to Balo and Ballon in 1929. Of their series of 24 autopsied cases this type of obstructing metaplasia was found in one or more ducts in 13. In 150 routine autopsies for conditions other than pancreatitis in individuals over twenty-five years of age it was found in 18.6 per cent, and was associated with old or fresh hemorrhages in 20 per cent.

With this lesion in mind, one of us has reviewed the available autopsy sections in cases of acute hemorrhagic pancreatitis put at his disposal by the pathologists of five hospitals.* The sections were from 12 autopsied cases. In only 2 of these were there appearances which could be interpreted as the metaplasia which Rich and Duff describe. Blood vessels showing necrosis of the walls were not uncommon. Typical nodules of metaplasia were found in 3 pancreases from autopsies for conditions other than pancreatitis†.

Assuming the validity of Rich and Duff's contentions, the following sequence of events is logical.

- (1) Obstruction of the pancreatic ducts.
- (2) Rupture of the duct-acinar system, due to back pressure.
- (3) Escape of the tryptic ferments.
- (4) Necrosis of the vessel walls.
- (5) Hemorrhage into the intersutural tissue with necrosis of the gland.

Certainly their conception is sufficiently intriguing to be kept in mind and to be evaluated by careful observation in future cases by both surgeons and pathologists.

SYMPTOMS

Upcott vividly describes the acute fulminating attack thus:

Sudden agonizing pain in the upper abdomen, radiating through to the back, usually occurring after a full meal in a stout person of middle age, rapid thready pulse and extreme collapse, early incessant vomiting, cyanosis of the face and extremities, sometimes of the abdominal wall, constipation and distention of the transverse colon, but not absolute obstruction, local persistent tenderness in epigastrium, contrasted with absence of general abdominal rigidity in the early stages, and, later, development of a swelling above the umbilicus—all these make an unmistakable picture.

In the majority of our cases less violent onset was the rule. Although typically the pain is referred across the upper abdomen, it may be localized in either upper quadrant. The frequency of associated gall bladder disease together with right-upper-quadrant pain explains why acute hemorrhagic pancreatitis is frequently diagnosed as biliary colic or acute gall-bladder disease.

The persistent pain, continuing until shock supervenes, is highly suggestive. A point of maximum tenderness about 5 cm above the navel, elicited by deep palpation, has been observed in several of our cases, and is thought to be a helpful differential point. There is usually extreme

tenderness over the upper abdomen. If the tryptic ferments are draining through the foramen of Winslow into the peritoneal cavity, the examiner will usually find some generalized tenderness associated with rebound pain, pointing to a chemical peritonitis. If the foramen of Winslow is not patent the tenderness will be limited to the upper abdomen. If the lesser omental sac is filled with fluid a mass can be felt, but it is probable that the pancreas itself is seldom palpated. Archibald recommends thumb palpation, by which he says the outline of a diseased pancreas can be clearly defined.

Brocq and others point out that the acute attack is usually an episode in chronic pancreatitis or a complication of biliary-tract disease. If the general practitioner as well as the surgeon would recognize that many instances of so-called acute indigestion are really due to small hemorrhages, edema or mild inflammation of the pancreas, and would check up carefully for possible causes in the biliary tract, it is highly probable that some of the catastrophic attacks could be averted.

Earlier writers found the disease more prevalent in men. Nowadays the pendulum seems to have swung the other way. Schmieden and Sebening,

Table 3 Data on Cases of Acute Pancreatitis

CASE NO.	YEAR	SEX	AGE	TYPE	RESULT
1	1904	F	48	Acute hemorrhagic fulminating	Recovered
2	1920	F	46	Subacute exudative	Recovered
3	1921	M	73	Subacute exudative	Recovered
4	1925	M	42	Acute hemorrhagic	Recovered
5	1926	F	38	Acute hemorrhagic	Recovered
6	1926	F	35	Acute hemorrhagic	Dead
7	1926	F	28	Acute hemorrhagic	Recovered
8	1927	F	15	Acute hemorrhagic	Recovered
9	1927	M	59	Subacute hemorrhagic	Recovered
10	1928	F	54	Acute hemorrhagic	Recovered
11	1929	F	20	Acute hemorrhagic	Recovered
12	1930	F	37	Acute hemorrhagic	Recovered
13	1936	F	34	Acute hemorrhagic	Dead
14	1936	M	31	Acute hemorrhagic	Dead

from the largest compilation of which we are aware, state the incidence in women as 77 per cent. The percentage in our group was 71 (Table 3).

DIFFERENTIAL DIAGNOSIS

Inasmuch as the acute fulminating type of pancreatitis presents aspects which may call for quick decision and prompt action, it is well to have in mind a definite plan of approach to the problem. In our process of differentiation we must consider nonsurgical conditions, among which ingestion of corrosive poisons and coronary occlusion are outstanding. The history of onset following food or drink and the character and content of the vomitus—with regard to blood, foreign color, odors, reaction—should quickly orient one as to the ingestion of poison. Coronary occlusion usually occurs in mid-life or beyond, the pain may be

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epigastric but is more often anginous. Dusky pallor is commoner than cyanosis, fibrillation and pulse deficit may occur with subnormal blood pressure. Leukocytosis if present is of moderate degree. An electrocardiogram may give definite aid. In a few hours absence of the signs of an acute abdomen, with probable development of a pericardial friction rub and moderate rise of temperature, clears the picture.

Acute diaphragmatic pleurisy or pleuropneumonia are possibilities which have to be considered, but their association with respiratory symptoms and signs is fairly characteristic and their elimination is relatively easy.

With the above possibilities removed, the various types of acute surgical abdomen are before us. Perforated appendix may generally be diagnosed by the history of onset and the concentration of local signs in the lower right quadrant, specific tenderness and local muscle spasm being the most reliable. Rectal examination may reveal right-sided tenderness, or even a mass. Vomiting is less conspicuous unless peritonitis has developed. Leukocytosis is moderate rather than extreme.

Perforated duodenal ulcer is more difficult to differentiate. Typically the patient collapses wherever he may be and the abdominal muscles splint tightly, vomiting is uncommon, and if it occurs, is rarely more than a sudden emptying of the stomach and does not relieve the pain. Shock may be considerable and the temperature subnormal. The patient lies still, and movement of his body muscles aggravates the pain. Liver dullness may be obscured, and a "scout film" may show a gas bubble under the diaphragm. Leukocytosis appears before the temperature climbs.

Acute intestinal obstruction is most readily recognized through its complex of obstipation, colicky pain, distention of bowels, visible peristalsis, vomiting of upper intestinal contents and a characteristic picture by x-ray film.

Rupture of a distended gall bladder may give a picture somewhat similar to that presented by perforated ulcer. It is usually less violent, however and may be preceded by a history of disease in the biliary tract. Pain, tenderness and muscle spasm spread from the right rib border over the right side of the abdomen more slowly than is the case in perforated ulcer.

Mesenteric thrombosis usually occurs in the arteriosclerotic patient. Ileus develops rapidly, bloody dejections may occur spontaneously or follow enemas. Vomiting, prostration and leukocytosis are to be expected. This condition is not very common, and its elimination is difficult.

In women, ruptured ectopic pregnancy has to be ruled out. Here the history of menstrual ir-

regularity, location of the initial pain, which is often so severe that the patient faints, rapid development of acute anemia with signs of fluid in the peritoneal cavity, and a tender cervix and other findings on vaginal examination, are all helpful.

Attacks of simple biliary colic are fairly definite, and the pain is characteristic. Originating under the right rib border, it stabs through to the back and radiates to the right scapula region. When it is severe the patient rolls about in agony. The attack is afebrile. The white blood-cell count is not elevated. Vomiting is fairly common. The pain may end suddenly by the stones accomplishing its passage, or peter out to dull aching misery if the stone lodges somewhere along the tract. Jaundice then makes its appearance and our diagnosis is confirmed. This is often the stage in which the patient reaches the surgeon, the hypodermic needle of the family doctor having served during the attack.

Cholecystitis may exhibit fever, chills, localized tenderness and sometimes tumor and leukocytosis, according to the degree of infection and the peritoneal irritation, and icterus according more or less to the associated cholangitis or stones in the common ducts.

Acute pancreatitis may be associated with any of these biliary tract conditions, if so, palpation reveals tenderness extending across the epigastrium, at times even to the left costovertebral angle.

Standing out clearly in the complicated possibilities of upper abdominal crises, an attack of acute fulminating pancreatic necrosis with hemorrhage is quite typical. The patient is likely to be in agonizing pain, vomiting often and without relief, mentally alert if not already narcotized, anxious, too sick to express his agony other than by moans, inclined to lie on the right side, which relieves tension in the lesser omental cavity by drainage through the foramen of Winslow, averse to examination, and with distinct tenderness across the epigastrium, where there is deep resistance or a feeling of fullness. Hiccoughs may be persistent and annoying. The abdomen is distended, but not so rigid as in perforated ulcer. With subnormal temperature, thready pulse and low arterial tension, the leukocyte count may reach 35,000 or 40,000. The urine is scant, and usually contains albumin and casts.

There may have been a full meal just prior to the attack, or alcoholic indulgence. Patients are apt to be plethoric, and may be cyanotic from splinting of the diaphragm or some quality inherent in the toxemia. The slate-gray cyanosis of the skin of the abdomen described by Halstead has not been observed by us.

Because of the many variables and complicating factors which characterize the clinical aspects of

all acute disease processes of the upper abdomen, a clear-cut diagnosis of acute pancreatitis cannot always be made. In our series we were right in 6 cases, or 43 per cent, partly right in 4 or 29 per

Table 4 *Preoperative and Postoperative Diagnoses in This Series*

PREOPERATIVE DIAGNOSIS	POSTOPERATIVE DIAGNOSIS	NO. OF CASES
Acute hemorrhagic pancreatitis	Same	1
Cholelithiasis cholecystitis	Cholelithiasis subacute pancreatitis	1
Cancer of stomach pancreatitis (?)	Cholelithiasis subacute pancreatitis	1
Acute pancreatitis	Acute hemorrhagic pancreatitis	3
Impacted stone in common duct or pancreatitis	Impacted stone in common duct and pancreatitis	1
Cholecystolithiasis	Same acute pancreatitis	1
Acute abdominal crisis cause undetermined	Acute hemorrhagic pancreatitis	1
Acute pancreatitis	Same cholecystolithiasis	1
Gall bladder disease with pancreatitis	Same	1
Acute abdominal crisis perforated ulcer ()	Acute pancreatitis with cholecystitis	1
Acute pancreatitis (?) cholecystitis (?)	Acute hemorrhagic pancreatitis	1
Acute pancreatitis alcoholic gastritis	Acute pancreatic necrosis (limited postmortem)	1
	Total	14

cent, and the diagnosis was missed in 4, or 29 per cent (Table 3). Fifty-seven per cent of our proved cases were associated with gallstones.

LABORATORY AIDS TO DIAGNOSIS

Considerable progress has been made in laboratory aids to clinical identification of the disease. The routine blood counts are invaluable, since they reveal the intensity of the systemic reaction and the extent of blood loss. Hyperleukocytosis, as has been stated, is the rule and develops early. Acute anemia may be evidenced by low hemoglobin and red-cell count, and when present must be correlated with other signs and symptoms. If the diagnosis lies between pancreatitis and ruptured ectopic pregnancy, a low count favors the latter.

Blood-sugar estimations, including the glucose-tolerance test and blood and urine amylase determinations, when considered together and intelligently correlated to the clinical situation, have been found useful by several investigators. Quick, discussing a paper by Upcott, made the surprising statement that in Melbourne following the use of the urine diastase tests at the Albert Hospital the preoperative diagnostic accuracy increased from 30 to 100 per cent.

Not many writers share this enthusiasm. Hyperglycemia has been noted in acute pancreatitis by a number of them. Brocq and Varangot in 72 cases found the blood sugar below 150 mg per cent in but 15, 150 to 200 mg in 25, and 200 mg or over in 34. In a fatal case (Case 6) of our series it was 210 mg the first day in the hospital, 270 mg

on the fourth (operation) day, and 360 mg on the fifth, which was the day of death. The patient in Case 8, who was very ill and was transfused after the operation, had a blood sugar of 400 mg on the day of entrance. Case 5, reported heretofore as one of pancreatic deficiency, reached 360 mg on the eighth postoperative day. Case 10 on the day of operation had a blood sugar of 220 mg. Case 12 one day postoperatively had one of 160 mg. Case 14, a fatal case, which was not operated on, had one of 212 mg. Case 3, a subacute one, showed the normal figure of 110 mg. Thus, 6 of 7 cases in which blood-sugar determinations were made were definitely well above the high normal mark, this harmonizes with the findings of Brocq and Varangot, who feel that in acute abdominal crises a blood sugar of 200 mg or over may be significant of acute pancreatic necrosis. Wildegans declares that blood sugar elevation occurs in every case of acute necrosis and designates it as a "certain early symptom." Elman warns that diabetics may be subject to acute abdominal conditions. Most of us are familiar with the acutely dilated stomach of impending diabetic coma.

The estimation of amylase in both blood and urine is now practicable, and gives high values in acute pancreatic necrosis. Elman and his associates have done much work with urine-amylase determinations, and recommend that they be made in all cases of acute disease of the upper abdomen. They warn that the rise of urine amylase must be 1000 Wohlgemuth units or more in order to be suggestive of acute pancreatitis.

It also seems clear that the blood lipase is elevated along with the amylase. We were unable to find a test for lipase suitable for clinical use.

For most of us the blood-sugar estimations and the Wohlgemuth test for urine amylase are practicable, and our laboratories should be prepared to support the clinician with these aids at short notice and at any time.

Confronted with such a clinical problem, if one has considered these differential points and observed and weighed the findings, in case doubt remains, exploratory laparotomy becomes an imperative diagnostic measure.

TREATMENT

It is well recognized that the disease varies greatly in intensity. Whatever the accident may be which ushers in the attack, if enough of the gland is involved in the ensuing necrosis, the patient dies. Two of our 14 cases were of this type. Both succumbed—1 with and 1 without operation. A few cases—83 of the 1510 covered by Schmiedens

report—recover spontaneously. Between these extremes lie 85 per cent of the cases which by accepted practice have been treated operatively. The optimum time for operation is subject to considerable difference of opinion.

Of late there has been a tendency to delay operation unless the diagnosis is too obscure to justify the chance of waiting. McWhorter noted that among the cases collected from his Chicago colleagues the mortality was lower in the group operated upon two weeks after the onset.

Eliason and North, who have followed the common practice of operating promptly, found upon analysis of their cases, which like our own numbered 14, that of 8 cases with immediate opera-

In 1908 Glaessner showed that 8 cc of trypsin injected intraperitoneally would kill a dog in five hours. Rich and Duff have shown that under certain conditions the pancreas actually secretes active trypsin, consequently it seems fair to suppose that the longer this digestive ferment is allowed to escape into the peritoneal cavity, the greater the harm to the patient.

Based upon our experience, we believe that operation at the moment which seems best to the competent and experienced surgeon will in the long run give the best results. Such a surgeon

Table 6 *Type of Operation Performed in This Series of Cases of Acute Pancreatitis*

TYPE OF OPERATION	NO. OF CASES	RECOVERED	DIED
Irrigation drainage to foramen of Winslow	1	1	0
Multiple incisions of capsule anterior drainage of pancreas, cholecystectomy, cholecystostomy	1	1	0
Multiple incisions of capsule anterior drainage, cholecystostomy	1	4	0
Anterior drainage of pancreas	1	2	0
Anterior drainage of pancreas drainage to foramen of Winslow		0	1
Cholecystostomy anterior drainage of pancreas	1	1	0
Cholecystostomy multiple incisions of capsule anterior drainage of pancreas	1	1	0
Anterior drainage of pancreas transillumination	1	1	0
Totals	13	11	2

will not operate upon the moribund, will allow no unnecessary loss of time in the fulminating case and will not hurry in the less acute, where he sees a chance of improving the patient's chances by delay. He will not neglect suitable measures to combat shock, relieve emesis and restore fluid and acid-base balance, while preparations for operation are going forward.

The surgical aims in the treatment of this disease may be summarized as follows:

- 1 To complete diagnosis by the accurate method of visualizing the lesion.
- 2 To offer an escape for the tryptic ferments and the toxic products of necrosis by draining the lesser omental sac.
- 3 To relieve the intrapancreatic tension by multiple nicking or incising of the peritoneal covering of the gland.
- 4 To decompress an obstructed pancreatic-duct system by drainage of the biliary tract by whatever method is appropriate to the patient's condition and type of lesion found.

The lowest mortality in McWhorter's and our series was found in the groups where all these procedures were carried out. Needless to say, the operation should be conducted with every provision for supporting the patient's vitality. Anes-

Table 5 *Time of Operation in Relation to Onset of Attack*

PERIOD FROM ONSET TO OPERATION	NO. OF CASES	OUTCOME RECOVERED	DIED
7 hours	1	1	
12 "	1	1	
14 "	1	1	
24 "	1	1	
36 "	1	1	
Totals	5	5	0
43 hours	1	1	
48 "	1	1	
Totals	2	2	0
5 days	1	1	1
6 "	1	1	1
10 "	1	1	
16 "	1	1	
Indefinite	1	1	
Totals	6	4	2
Grand totals	13	11	2

tion 6 died, while of 5 cases with operation deferred four to nine days all recovered. One patient moribund on admission was not operated upon and succumbed. Interestingly enough, our own cases constitute a group clinically similar to theirs, except as to the relation of time of operation to fatal outcome. They were numerically the same, 1 case being moribund and not operated upon, and the remainder all being operated upon at periods varying from seven hours to sixteen days after onset with but 2 deaths. Five patients were operated on within thirty-six hours, and all lived. Two operated on at forty-three and forty-eight hours respectively, lived. Of 3 who were operated upon on the fifth and sixth days 2 died. The remaining 3, operated upon on the tenth and the sixteenth days and after an indefinite period respectively, recovered. While we admit that our cases may have been on the average less severe than Eliason and North's, we believe strongly that in 2 cases prompt operation saved the patients' lives, while in another, delay from the second to the fourth day sacrificed the patients only chance of survival.

thetia planned for minimal toxicity, a speedy and nontraumatic operative technic and transfusion should be among them. Ample and effective drainage of the pancreas must be secured and maintained until nature discards all necrotic remnants of the gland. Postoperative complications must be met as they arise. Hemorrhage, pancreatic asthenia, defective wound healing and diabetes may each or severally be encountered. Recurrence of the disease is not unknown.

A word needs to be said about intravenous glucose therapy. As has been pointed out, hyperglycemia is the rule. It has also been noted that pancreatic secretion is stimulated by glucose. If obstruction to the duct is so large a factor in initiating the attacks, this would seem to contraindicate its use. We therefore feel that the administration of insulin may be of greater advantage to the patient. As a practical matter it is suggested that we orient ourselves in this regard whenever confronted by a case. Among the earliest diagnostic measures the blood should be secured for estimation of sugar, chloride and nonprotein nitrogen. A catheter specimen of urine should be obtained at the same time. Through the diagnostic venepuncture needle introduce 100 gm of glucose in sterile solution. Let this serve for a glucose-tolerance test. Take additional blood and urine samples at hourly intervals and plot the results for three hours if so much time is available before operation. Make use of some of the urine for amylase estimation. Thus therapeutic and diagnostic methods may be combined to spare the patient unnecessary venepunctures and loss of time.

With an initial hyperglycemia and a lowered glucose tolerance, the patient shows evidence of pancreatic damage. With 200 mg of blood sugar or over in the blood and a urine amylase of 1000 or over, our diagnosis of acute pancreatitis is supported.

SUMMARY

In a study of recent literature and a small series of personal cases, we find acute pancreatitis to figure clinically in forms of differing severity, with the milder types increasingly recognized.

Associated biliary-tract disease is still the apparent cause of more than half the cases.

Attention is called to a new conception of causation advanced by Rich and Duff, of which obstruction by metaplasia of duct epithelium, rupture with escape of trypsin and a specific vascular lesion are the essential elements. Concentrated study of this idea by surgeons and pathologists is urged.

In the acute fulminating cases operation judiciously timed remains the therapeutic measure of choice. Operation is also the most reliable diagnostic procedure.

The diagnostic value of blood-sugar and blood amylase estimations, the glucose-tolerance test and urine-amylase determinations are noted and their clinical use advocated.

Finally, a series of 14 cases are recorded of which 13 were treated operatively with 2 deaths, an operative mortality of but 15 per cent.

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DISCUSSION

DR ERNEST L. HUNT, Worcester. I am grateful to Dr Dunlop for his work in looking up the literature on this subject and in compiling this paper. The Rich and Duff conception of the etiology of acute pancreatitis has intrigued me, and through the courtesy of Dr Rich I am able to show a few slides of nodular metaplasia of the duct epithelium.

Obstruction to the pancreatic secretions perhaps deserves a bit more attention than it gets. [Slide.] This is a sketch made to illustrate the new theory. The stone in the ampulla is inserted not to take us back thirty-seven years to Dr Opie's original concept of the ducts being changed into a continuous passage, but rather to emphasize the notion that back pressure in Wirsung's duct resulting from obstruction at the ampulla causes rupture of the duct acinar system, liberating tryptic ferments which in turn cause necrosis and hemorrhage.

It has been shown that the pressure of secretion in the pancreas is generally a bit greater than that of bile in the common duct. This condition is reversed during considerable muscular effort, such as sneezing, which brings the diaphragm and abdominal muscles into action and increases the pressure of bile in the gall bladder to a point far above that reached under normal conditions.

The small spots are put in to indicate obstruction in the minor ducts or ductules from the metaplastic nodules, resulting in the breakdown of the tissue behind them. This process usually causes dilatation of the ductules and sometimes the formation of necrotic foci, which may rupture upon any sudden increase in pressure. The difference in degree is of course indicated by the difference in the

size of the duct obstructed and the nearness to a vessel of considerable size.

[Slide.] Rich and Duff also describe a vascular lesion which they maintain they were able to reproduce by injecting trypsin, or the pancreatic juice obtained by cannula into the subcutaneous tissue of animals. The injection of either of these substances is immediately followed by edema and hemorrhage, and after a few hours the wall of the blood vessels affected show a segmental necrosis. This naturally becomes the point of rupture and of hemorrhage. Rich and Duff consider this lesion typical.

[Slide.] This is also one of Rich's sections showing nodular hyperplasia. It is found in a wide variety of conditions, and he and Duff say they have found it in most sections taken from patients who died of acute pancreatitis. I have not been able to verify this statement in detail, but the sections to which I had access were obviously not cut with any thought of that lesion in mind.

Some of you may have noticed that Dr. Dunlop used the word prophylaxis. By prophylaxis in relation to acute hemorrhagic pancreatitis we imply the care of biliary disease in its early stages, as recommended by Clute, Lahey and others.

[Slide.] This is a photomicrograph of a section of pancreas from an autopsy which was kindly lent by Dr. Wolbach. The cause of death was nephritis and complications. The illustration shows an obstruction due to a basal-cell metaplasia of the duct epithelium exactly like that in Dr. Rich's specimen from a case of acute pancreatitis.

I think we may say that in general the nearer the operation comes to the onset of a severe condition of this sort, having due regard to the factors of safety, the more likely we are to relieve the patient of his disease.

DR. I. J. WALKER Having read Dr. Dunlop's interesting paper in manuscript, I believe that the pertinent points for discussion of this important subject are as follows: (1) consideration of the gross pathological aspects of acute pancreatitis, and (2) treatment of the different phases of the disease. Both are important in influencing the present high mortality attendant upon surgery of acute pancreatitis. In reviewing my own cases, as well as those treated at the Boston City Hospital for the past seventeen years, we may well classify them as acute edematous, acute hemorrhagic, and acute suppurative.

Acute edematous pancreatitis, seen rarely at postmortem, grossly shows no evidence of hemorrhage or suppuration but presents a swollen, edematous organ. Clinically this type has a mild symptomatology as compared with the hemorrhagic type. We have found, as have others, that this type of lesion generally ends in spontaneous recovery. These cases at present are rarely diagnosed as such, and surgery, when carried out, has been deemed advisable only because of mild but persistent symptoms referable to the upper abdomen. Accumulation of a considerable number of these cases in a series of cases of acute pancreatitis will tend to give a low mortality for the disease.

Acute hemorrhagic pancreatitis when seen early presents the well known gross pathological picture, and at a later stage shows gangrene or suppuration. The present mortality of acute hemorrhagic pancreatitis treated early by surgery is about 75 per cent.

In suppurative pancreatitis the infection reaches the pancreas by the hematogenous route, via the lymphatics, or by direct extension. The mortality is lower than that of acute hemorrhagic pancreatitis.

What shall be the treatment of these various phases? Of late much has been written on the conservative or medical treatment of acute pancreatitis, with results ap-

parently as good as or better than those obtained by surgery. The lesions of cases which recover without operation being unknown, we must ask what was the actual pathologic picture. One can be sure that most edematous cases of pancreatitis, and some hemorrhagic ones, will recover spontaneously or by medical treatment. Prac-

Table 1 Age by Decades

AGES	NO. CASES
15 to 20	2
20 to 30	6
30 to 40	17
40 to 50	19
50 to 60	20
60 to 70	6
	70

Males 44% females 56%

tically it appears that if one suspects acute pancreatitis of low grade, as evidenced by symptoms and clinical findings, surgery is not advisable for the disease *per se*, but may be indicated on the basis of an accompanying acute lesion of the gall bladder. Likewise, emergency surgery is contraindicated in those cases of hemorrhagic pancreatitis where shock and toxemia are manifest. Under treatment consisting of parenteral fluids and decom-

Table 2 Duration of Symptoms before Operation

DURATION	NO. CASES	DEATHS	MORTALITY %
0-12 hours	20	15	75
12-24	13	8	62
24-48	17	8	47
2-6 days	11	2	18
7-12	4	2	50
Over 12 days	5	5	100
	70	40	57

pression of the upper intestinal tract by the Wangensteen method, some of these cases will recover without surgery, and those in which surgery becomes necessary will be better prepared for it.

The treatment of suppurative pancreatitis calls for no special comment, other than that the pancreas should be drained when pus is apparent.

Briefly, immediate surgery is not indicated in cases of

Table 3 Type of Operation

	NO. CASES	DEATHS	MORTALITY %
Cholecystostomy and drainage of pancreas	34	18	53
Cholecystectomy and drainage of pancreas	7	4	57
Drainage through foramen of Winslow and drainage of pelvis	9	5	56
Drainage of pancreas	10	10	63
Cholecystostomy	2	1	50
Exploratory laparotomy (lesion discovered at autopsy)	2	2	100
	70*	40	57

54 per cent of total showed gall bladder disease.

acute pancreatitis with mild symptoms unless for an accompanying acute lesion of the biliary tract, nor is immediate surgery advocated in cases demonstrating shock. It is advised in cases of acute pancreatitis after shock and toxemia have been treated, and when the symptoms and clinical signs do not show evidence of retrogression it is assumed that gangrene or suppuration forms part of the pathologic picture.

The accompanying tables show some facts regarding our

experience with acute pancreatitis at the Boston City Hospital. Table 1 substantiates the recognized incidence of acute pancreatitis according to age and sex. Table 2 demonstrates the high mortality attendant upon early operation. The mortality of 18 per cent for the two- to six-day period is of interest. Study of this group substantiates our experience to the effect that the prognosis is better among cases which are not fulminating, hence not diagnosed early and consequently not operated upon at once, surgery being finally carried out for persistence of symptoms referable to the upper abdomen. None of this group were deliberately treated by conservative medical measures. Analysis of the figures in Table 3 indicates cholecystostomy with drainage as far down as the pancreas as the operative procedure of choice.

DR ROLF LIUN, Boston. During the past year we have had occasion to use the urinary diastase test for a number of patients with pancreatitis at the Boston City Hospital, and have found it of considerable diagnostic value. Briefly, this test consists of adding various dilutions of urine to a 0.1 per cent starch solution and incubating for half an hour. Iodine is then added as a reagent to indicate the end point of digestion. The urinary diastase may be elevated in a number of conditions—acute cholecystitis, common duct stone, carcinoma of the pancreas, acute hepatitis, ulcers invading the head of the pancreas and acute parotitis.

The test must be considered only as an adjunct to the clinical picture and history. In 3 cases diagnosed as perforated ulcer we found elevated diastase in the urine. Operation in each case revealed acute pancreatitis. Two patients who had been submitted to previous biliary tract surgery were studied. One had had a cholecystotomy twenty-four years previously, the other had had her gall bladder removed three months previously. Both had the history and clinical picture of acute pancreatitis and elevated diastasia. They were treated conservatively and recovered.

A case seen last week had the history of acute pancreatitis, with physical findings of acute gall bladder disease. The urine diastase was definitely elevated, and a diagnosis of acute gall bladder disease with associated pancreatitis was made. Both lesions were demonstrated at operation.

Not all patients with acute pancreatitis give elevated diastase values. If destruction of the pancreas is so extensive that little of the external secretory elements remain, the diastase may be subnormal. We have had no experience with such cases, but Millbourn records 12 in 13 cases of acute pancreatic necrosis.

If we are to treat acute pancreatitis conservatively, we might well add two measures to the routine handling. We might place an intubing Levine tube in the duodenum and give repeated small doses of magnesium sulfate through it, thus obtaining increased drainage of the biliary and pancreatic ducts and probably doing as much good as is accomplished by surgical drainage of the gall bladder. Or we might give repeated doses of alkali and neutralize the hydrochloric acid of the stomach, which forms secretin in the duodenum. By such therapy we should prevent the absorption of secretin, which is the most powerful pancreatic secretagogue known, and thereby help forestall further swelling of the pancreas by repeated stimulation.

DR EDWARD L. YOUNG, JR., Boston. The discussion so far conducted gives me the impression that everyone makes the diagnosis of acute pancreatitis easily and accurately

and of course correct treatment can occur only if there is a correct diagnosis.

On my service at the Massachusetts General Hospital in 1936, we were faced with the difficult problems of conservative treatment. We became interested in this type of treatment after reading the article by Mikkelsen in the *Acta chir Scandinav* (75:373-415, 1934) in which it was said that the mortality could be reduced from 60 to 20 per cent by delaying operation for from several days to two or three weeks. I tried this with 1 patient. She finally died of spreading sepsis, which I attempted to drain too late, and which did not affect the pancreas. At a staff meeting, it was found that there were 4 or 5 other cases which had been treated conservatively, all with fatal results, and in none of which damage to the pancreas was shown at autopsy.

DR. EDWARD R. LAMPSON, Hartford, Connecticut. I have been much interested in pancreatitis ever since I started practice, when I had a case of the acute hemorrhagic type. The symptoms pointed to acute inflammation of the gall bladder. Dr. Oliver C. Smith operated. When he opened the abdomen, a blood red mass immediately presented in the wound. He started to put a needle through it, upon which I remarked, "That is not the gall bladder." He insisted that it was, and proceeded to pass the needle, when a profuse hemorrhage occurred. He inserted another needle with a ligature with the intention of doing a cholecystostomy, an operation seldom performed at that time.

The hemorrhage was so great that the remainder of the operation was spent in controlling it. We ran out of gauze, so that the old gauze had to be wrung out in water and used over and over again. Finally three large clamps were employed to control the hemorrhage, and the wound was packed. The family physician and I stayed up all night with the patient. Taking boiled normal salt solution and using a fountain syringe and a fountain pen filler, we gave intravenous saline, a hypodermoclysis under the breasts and saline by rectum. Much to our surprise the patient recovered. On the ninth postoperative day she had a secondary hemorrhage, which was controlled by packing.

In the meantime I had examined the specimen removed at operation, and found that the case was one of acute hemorrhagic pancreatitis. A rubber drainage tube was left in the abdomen for six months, for fear that the pancreatic secretions might digest other organs or form a pancreatic cyst. One morning at the end of that period I was notified that some coffee which the patient had drunk was coming out through the tube. This showed that she had developed a gastric fistula. I had her removed to the hospital and took out the drainage tube, and the fistula closed in three days. I published a record of this case in 1903, and it proved to be the first case of acute hemorrhagic pancreatitis reported in Connecticut.

If I recall correctly, Reginald Fitz brought before the medical profession in this country not only appendicitis but also pancreatitis. He adopted the same pathological classification that we have heard about today: acute hemorrhagic, suppurative and gangrenous.

Judging from the cases that we have had at the Hartford Hospital, I should say that our mortality had been much nearer 50 per cent than the 15 per cent reported by Dr. Dunlop.

As we are all aware, there is now considerable discussion as to whether these cases should be treated expectantly or should be operated upon at once. If the former procedure is adopted and a diagnosis of acute pancrea-

thus is made, and the patient recovers, how can we be sure that the diagnosis was correct?

We have had no experience with the diastase test in urine or blood, and I doubt whether it has been used in enough cases to prove its accuracy. The diagnosis is

difficult under any circumstance, and I have frequently seen cases where a diagnosis of acute pancreatitis made previous to operation was found to be incorrect. In all but the mild cases I prefer immediate operation to conservative treatment.

POSTURE IN ANESTHESIA

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IT MAY be stated as a principle that an anesthetized patient should never be placed in a posture which he could not safely assume if he were conscious. The fat dowager who would die within an hour if suspended by the heels will be similarly affected by the Trendelenburg posture while under the influence of an anesthetic. Ill-advised postures are responsible daily for surgical fatalities.

Contrary to common opinion, the so-called Trendelenburg posture, in reality originated by Bardenheuer, of Cologne, is not the most favorable for the anesthetized patient. Trendelenburg, indeed, first described its danger and advised against its use for fat patients. The most favorable posture is the dorsal recumbent one, with the head slightly lowered. Without increasing the cardiac and respiratory load, this posture maintains a cerebral blood pressure higher than that at the cardiac level, and increases the arterial blood supply to the cerebral centers. Unfavorable postures are the lithotomy, with elevation of the pelvis recommended for perineal prostatectomy, and the so-called reverse Trendelenburg postoperative. The prone posture has so bad a reputation that some army regulations strictly forbid the turning of an anesthetized patient from the dorsal to the prone posture.

With the aid of a synchronous pneumograph we have shown that the difficulty with the prone posture is partly if not wholly respiratory.¹ All anesthetics with which we are acquainted produce paralysis of the thoracic muscles of respiration. The diaphragm then takes on the entire respiratory load. If the patient is placed face downward on the firm surface of an operating table, the diaphragmatic or abdominal respiration must be carried on under a handicap which may be appreciated by noticing that the patient's buttocks are lifted with each attempt at diaphragmatic inspiration. This handicap may be removed by placing a pillow transversally across the table opposite the anterosuperior iliac spines.

For obtaining the postures desired for many op-

erations in inflatable rubber cushion is more useful than the attachments usually provided with operating tables. The cushion is rectangular, measures 25 by 50 cm. and has a stout rubber tube attached at one corner and terminated by a cut-off valve. It is inflated with compressed air or with nitrous oxide from the gas machine. Oxygen or inflammable gas should not be used, because of the risk of explosion. The cushion should be strong enough to support the weight of an



Figure 1. Gall Bladder Posture. The cushion is inflated until the shoulders are raised from the table and then allowed to deflate until they just touch the table. In this illustration the cushion is allowed to protrude under the arm in order to show its position.

adult. The tube should be long enough to reach the head of the table, where the shut-off valve can be controlled by the anesthetist. The bag should be covered with a fresh pillow slip; it should be frequently sterilized.

For the cholecystectomy posture, the cushion is placed transversally across the table, centered under the ensiform cartilage. When protrusion of the epigastrium is desired, the cushion is inflated until the shoulders are lifted from the table, and then deflated until the shoulders just touch the table when the maximum extension has been obtained.

For thyroid operations, the cushion is placed transversally with its upper margin slightly below

the external occipital protuberance and its lower margin under the shoulders. It is inflated until the occiput is lifted from the table, then deflated until the occiput just touches the table, when the maximum possible extension has been obtained. Care must be exercised not to pin the drappings to the inflated cushion.

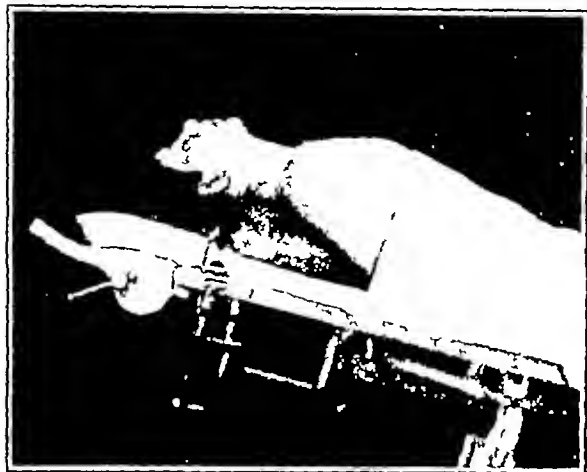


Figure 2 *Thyroid Posture* The cushion is inflated until the occiput is lifted from the table then allowed to deflate until the occiput just makes contact. At the close of the operation the tissues may be relaxed for application of the sutures by allowing the bag to deflate without disturbing the drappings.

For operations on the kidney, the patient is placed in the lateral posture with the lower hip and knee flexed at right angles. The cushion is placed transversally, centered between the lowest rib and the crest of the ilium. The pelvis is fixed by a broad strip of adhesive plaster extending from one side of the table across the upper hip to the other side.

The degree of extension is readily controlled by the anesthetist. The cushion may be inflated either immediately before induction or after the patient has been anesthetized.



Figure 3 *Prone Posture* The partially inflated cushion is placed under the anterosuperior spines slightly raising the pelvis and allowing continuance of abdominal respiration.

For the prone posture, the partially inflated cushion is placed transversally underneath the anterosuperior iliac spines, so as to favor continuance of abdominal respiration. A cushion provided with an extra long tube may be placed under the knees to secure relaxation of the abdominal muscles through flexion of the hips and knees, often desirable while suturing an abdominal wound. While these are the chief uses of the surgical posture cushion, other advantages will be discovered through habitual use.

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RUPTURED ANEURYSM OF THE LEFT COMMON ILIAC ARTERY SIMULATING PERINEPHRITIC ABSCESS

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A SEARCH of the literature reveals no record of a case of ruptured aneurysm of the common iliac artery simulating perinephritic abscess. Only one case of ruptured aortic aneurysm simulating perinephritic abscess was discovered¹

The incidence of aneurysm of the common iliac artery is relatively low as compared with that of all other aneurysms. Matas² found only 2 cases in a study of 172 aneurysms. Garland³ discovered only 1 case of aneurysm of the common iliac artery among 167 aneurysms found in the course of 12,000 autopsies. Lucke and Rea⁴ found not a single case among 321 aneurysms.

While perinephritic abscess may occasionally offer a challenge to detection, many less common or rare conditions may readily be confused with it.⁵ The case here reported apparently falls into the latter category.

CASE REPORT

A 57-year-old man, married, was brought into the New Hampshire Memorial Hospital by Dr G Gaudrault, of Concord, in whose office he had fainted. At that time Dr Gaudrault had felt a pulsating mass in the lower left quadrant. However, in view of all the subsequent findings and the absence of pulsations during the entire period of hospitalization, little stress was placed upon this finding.

Because the patient was very restless and incoherent, no adequate history could be obtained, and only a vague and fragmentary one was contributed by his wife. The patient had sustained a broken nose 25 years previously and a blow on the head 12 years previously. No history of abdominal trauma could, however, be elicited. Except for occasional sore throats and some diurnal frequency and nocturia, the patient had apparently voiced no complaints. Five days before admission he confided to a friend that he had pain in the region of the left kidney which was becoming progressively more tender. Questioning of the patient's wife elicited a history of recent skin infection as well as a vague suspicion of hematuria.

Physical examination revealed an obese, obviously sick man whose abdomen was considerably distended. The right side of the abdomen was tympanitic and non-tender. The left flank bulged somewhat. The entire left side was resistant to palpation, and was dull and very tender from the costal margin to the pelvis. The greatest tenderness seemed to be in the region of the left costovertebral angle. The patient complained continually of pain in the lower left quadrant and left back, faintness, headache and nausea. From time to time he vomited. The respirations were about 24 and the pulse ranged from 84 to 100. The blood pressure was 180/90. The temperature ranged from 98 to 103°F., and on the 2nd day of hospitalization the patient had a chill lasting 3 minutes.

On the day of admission the white blood-cell count was 13,000 with 88 per cent polymorphonuclear leukocytes, 11 per cent lymphocytes and 1 per cent monocytes, the red blood-cell count was 4,100,000 and the hemoglobin 85 per cent. The urine was acid, with a specific gravity of 1.036 and no albumin, sugar or acetone. The urinary sediment showed approximately 75 pus cells per high-power field. The Wassermann and blood Hinton tests were negative.

Intravenous pyelograms taken on the 2nd day of hospitalization revealed a clear kidney outline on the right, with normal delineation of the pelvis and ureter. There was good visualization of the right iliopsoas muscle. Considerable gas was present on the right side. The entire left side of the abdomen from the diaphragm to the pelvis was rather opaque. The left kidney could not be visualized, nor could the left iliopsoas muscle be discerned. The patient was then referred to the urological department. He was obviously too sick for further studies or procrastination. Because of the history and findings already given, the diagnosis of perinephritic abscess was made, and since the patient was steadily losing ground immediate drainage was advised.

Hypodermoclyses of salt solution were given. Under spinal novocaine, supported by Nembutal and ephedrine sulfate, an incision was made in the left loin. When it was carried down to the perirenal fascia a large, bluish, bulging, rather extensive mass presented itself. Upon cutting of the fascia the mass was found to consist of freshly clotted blood, together with apparently older clot. The kidney was deeply buried in this sanguineous mass. Exploration in the region of the pelvis revealed a spongy mass about the size of a grapefruit. Removal of a piece of the mass showed it to consist of old, white, laminated clot. The patient's condition immediately became poor. Because of a sudden and uncontrollable swelling of blood into the wound, a large pack was inserted and the wound was quickly closed. The patient's condition on leaving the operating room was critical, and he expired within a few minutes.

An autopsy restricted to the region of the lesion revealed an aneurysm of the left common iliac artery, which had apparently perforated several days prior to operation, causing a slow extravasation of blood into the retroperitoneal space formed by the downward extension of the two layers of the perirenal fascia. The aneurysm included the entire left common iliac artery from the point where it arose from the abdominal aorta to where it gave rise to the external iliac and hypogastric arteries. The rupture occurred on the posterolateral aspect of the aneurysm, and more superiorly than inferiorly. Thus the rupture was retroperitoneal and lateral. The perirenal fascia, which surrounded the kidney and its fatty capsule in the form of a loose sheath, was open inferiorly, the two layers remaining separate all the way down to the pelvis. The anterior layer crossed the great vessels in close apposition medially to join the corresponding layer of the opposite side. The extravasated blood had therefore taken the only course open to it and had spread up between the layers of the renal fascia, with the result that the symptoms were those of a perirenal lesion.

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VOLVULUS

A Study of Twenty-Two Cases

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TWENTY-TWO cases of volvulus operated upon in the past ten years at the Newton Hospital have been studied in detail in an effort to determine the factors that may contribute to the mortality in acute intestinal obstruction. Acute ileus still has a mortality rate ranging between 40 and 60 per cent. Volvulus accounts for approximately 15 per cent of all acute obstructions. Because of the similarity in the symptoms and treatment in the various forms of acute ileus, the conclusions drawn from this study are applicable to all types of the condition irrespective of the cause. There were 10 deaths in our series of 22 cases—a mortality rate of 45 per cent. The more important facts ascertained by this study are as follows:

Sex

There were 13 males with 6 deaths, and 9 females with 4 deaths. There was a greater prevalence of volvulus in men, but no definite relation of sex to mortality was apparent.

Age

The youngest patient was ten years of age, and the oldest eighty. Volvulus appeared to be evenly distributed in the different age groups, 11 patients being under forty and 11 over forty. Three of the 10 deaths occurred in the former group, and 7 in the latter—mortality rates of 27 and 64 per cent respectively. In this condition, therefore, as in others, age appears to play an important role in mortality.

Symptoms

The two cardinal symptoms in this series were abdominal pain and vomiting. The pain was of the colicky, intermittent type. Its location depended on the site of the obstruction. There were 4 instances of pain in the right lower quadrant, which were thought to be appendicitis. One case was provisionally diagnosed as ruptured ectopic pregnancy and another as perforated peptic ulcer. The

remainder were diagnosed as acute intestinal obstruction.

Vomiting was present in 21 cases, it was not mentioned in the history of the remaining case. The amount, character and frequency of the vomitus were determined by the height and severity of

Table 1 Comparison of Symptoms

SYMPTOMS	SMALL BOWEL LESIONS		LARGE BOWEL LESIONS		ALL LESIONS	
	No of Cases	Per Cent	No of Cases	Per Cent	No of Cases	Per Cent
Abdominal pain	16	100	6	100	22	100
Vomiting	16	100	5	84	21	95
Constipation	5	30	5	84	10	45
Distention	6	37	5	84	11	50

the obstruction. Patients with high occlusions complained more of this symptom than did those with low occlusions. Fecal vomiting was noted in only 4 cases, 2 of which terminated fatally. Too frequently one is inclined to wait for the vomitus to become fecal before making a definite diagnosis. This type of vomitus occurs as a late sign and denotes a poor prognosis.

Constipation has long been thought to be a cardinal symptom of acute intestinal obstruction. Its absence has frequently delayed a diagnosis. In our series this symptom was noted in only 10 cases—five times in the 6 cases of large bowel volvulus, and five in the 16 cases of small-bowel occlusion. One patient with high obstruction complained of diarrhea. Constipation is therefore of value as a diagnostic aid in obstructions of the large intestine, but its absence should never rule out an obstruction above this level.

Distention is also too often awaited in making a diagnosis of acute ileus. In the series studied it was noted in 11 cases. 5 of the 6 cases with large bowel volvulus, and 6 of the 16 with small bowel volvulus. It ranged in severity from slight to marked.

Abdominal tenderness and rigidity were rare findings. They usually indicated necrosis of the bowel wall.

The temperature was apt to be subnormal at the onset. A rise in temperature and in the white

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blood-cell count denoted damage to the bowel wall and early peritonitis

Duration of Symptoms

Careful analysis of this factor shows positively that the location and severity (amount of vascular occlusion) of the obstruction are of prime significance. The preoperative period in the entire series varied from twelve hours to seven days. Of the 10 fatal cases, 9 showed volvulus of the small intestine and 1 volvulus of the large intestine. The duration of symptoms in the former group ranged

Table 2. *Average Duration of Symptoms*

TYPE OF LESION	DURATION IN FATAL CASES	DURATION IN NON-FATAL CASES
Small intestine	2 days (3 cases)	16 days (7 cases)
Large intestine	6 days (1 case)	3.5 days (5 cases)

from twelve hours to five days, the average being forty-eight hours. In the recovered patients with small-bowel volvulus the average duration was thirty-eight hours. The patient with fatal large-bowel volvulus complained of symptoms for six days before operation. The surviving large-intestine cases presented an average duration of three and a third days. This indicates that a patient with a volvulus of the large intestine that does not completely stop the vascular flow may survive after a relatively long preoperative period, while one with a high, complete occlusion will succumb if operation is delayed only an hour or two. Delay in the latter group means that simple untwisting will no longer suffice and that extensive operative procedures are necessary to remove necrotic bowel. This need for immediate operation in high lesions is strikingly proved by the slight difference in the duration of symptoms between the fatal and the surviving cases of volvulus of the small intestine—forty-eight hours, as compared with thirty-eight. The delay of ten hours may have accounted for the fatalities.

Operations and Findings

As already stated 16 cases of small-intestine volvulus accounted for 9 deaths and in 6 cases of large-intestine volvulus there was only 1 death. The mortality rate in the small-bowel group was thus 56 per cent, and that of the large bowel group 16 per cent.

Small-Bowel Lesions There were 11 cases of involvement of only one loop, and 5 of involvement of the entire small intestine. Four patients gave a history of a previous operation for another condition. One of these operations was for perineal repair, done three days before. Another was for suture of a traumatic perforation of the small intestine, done six days before. Both these cases ter-

minated fatally. A shortening of the mesentery due to calcified tuberculous glands was the causative factor in a twelve-year-old patient and a fibrous band at the site of an appendectomy done some years before in another. The causes of the twisting in the remaining 12 cases could not be definitely determined. The twists varied in degree from 180 to 360°. Seven of the 9 deaths in this group followed more extensive surgery than simple untwisting. There were 5 enterostomies and 2 resections, all of which cases had a fatal termination. Lobar pneumonia and paralytic ileus were the causes of the other 2 deaths.

These findings emphasize the danger attended with extensive operations on patients that are already poor risks for even minor surgical manipulations. Operation before the onset of necrosis would undoubtedly have presented a different picture. Enterostomy as a treatment for distention is fast falling into disrepute. "Stripping" of the intestine is likewise becoming a thing of the past. Astonishing results are frequently obtained by nasal catheter drainage of the stomach, especially when mild suction is applied.

Large-Bowel Lesions Abnormal lengthening of the mesentery of the colon was the predisposing cause in all 6 cases. The fatal case was that of a seventy-year-old woman who had had symptoms of obstruction for six days. A volvulus of the cecum and ascending colon was found at operation. Because of necrosis of the bowel wall a Mikulicz operation was performed, but to no avail. This patient had been operated on fifteen years previously for a volvulus of the same portion of the intestine. There were 3 other cases of involvement of the ascending colon and cecum. Two of these were treated by simple untwisting. In the third there was a recurrence four months after operation. At the second operation it was deemed necessary to resect the involved portion, not because it was necrotic, but because it was so distended and atonic and the mesentery was so long that future recurrences seemed inevitable. A Mikulicz procedure was carried out. This patient made a delayed but good recovery and was in normal health when last seen two years after the second operation.

There was 1 case in which volvulus of the sigmoid recurred. The patient, a sixty-year-old male, was operated on and was relieved by simple untwisting. One year later the volvulus recurred. The bowel was distended and atonic, as in the case just described. Owing to the poor condition of the patient resection was out of the question and simple untwisting was all that could be done. He was in good health and had had no recurrences one and a half years after operation.

A procedure carried out on all the large-bowel cases with excellent results consisted in the insertion of a long rectal tube high in the rectum at operation. The tube was then worked up into the sigmoid, and even above it, in order to deflate the markedly distended colon after the untwisting. Closure of the abdomen was thus facilitated and disagreeable postoperative complications were averted.

Anesthesia

Nitrous-oxide and oxygen, followed by ether anesthesia, was used in 20 cases, and spinal anesthesia in 2. There were 9 deaths in the former group and 1 in the latter. Obviously no conclusions as to what type of anesthesia is safest can be drawn from so small a series.

* * *

It is no doubt true that preoperative and postoperative saline infusions are of great importance in abating the mortality of this condition. The enormous loss of blood chlorides associated with continued vomiting is a vital factor in the severity

of the disease, even when no necrosis of the bowel has taken place. Numerous observers have emphasized the need for replenishing this loss. The age and general condition of the patient also play a significant role in the mortality. But with knowledge of the mechanism and cause of the obstruction we believe that the most important factors are early diagnosis and early operation. It is obvious that only by these means can the mortality in cases of volvulus be appreciably decreased. This study bears out the old surgical dictum "The longer a patient with acute intestinal obstruction lives before operation, the sooner he dies after it."

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CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITALANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., Editor

CASE 24091

PRESENTATION OF CASE

A twenty-three-year-old, white, New England farmer entered the hospital with the complaint of lung trouble of eight years' duration.

About eight years before entry he began to spit up small amounts of blood. There was no cough at that time, but one month later he developed loud wheezing respirations and began to notice dyspnea on exertion. The wheezing disappeared in about six months, but the hemoptysis continued. He had no fatigue, night sweats, weight loss, chills or fever. Over a period of a year, four years before entry, he had three attacks of "bronchial pneumonia," characterized by cough, hemoptysis, fever, malaise and moderate weight loss. Following the last attack he continued to cough with accompanying dyspnea and hemoptysis. Five months later he had an attack of gastrointestinal disease consisting of fever and diarrhea which lasted for one month. His physician made a diagnosis of tuberculosis and sent him to a sanatorium in Arizona where he remained for a year. While there his sputum was said to contain tubercle bacilli on only one occasion, but this could not be verified on subsequent examinations. Treatment at the sanatorium consisted of the usual sanatorium regime and crushing of the left phrenic nerve. He was advised to have a left thoracoplasty but refused it. He felt well during his first six months there but during the last six months lost 20 lb in weight. He returned to New England two and a half years before entry and spent six months in an outside hospital. Bronchoscopic examination there was said to show a tumor pressing on the left bronchus. After discharge from there, he continued to have a chronic cough and raised moderate amounts of yellow sputum sometimes tinged with blood. He also had marked dyspnea on exertion and some palpitation. His appetite, however, was excellent, and his general health was good.

There was no history of exposure to tuberculosis. In early childhood he had had a severe attack of whooping cough accompanied by "bronchopneumonia." His past history and family history were otherwise negative.

Physical examination revealed a well-developed and nourished man in no distress. The blood pres-

sure was 130 systolic, 60 diastolic. The entire left chest was smaller than the right and was flat to percussion, there was no motion on breathing, and breath sounds, voice sounds and tactile fremitus were practically entirely absent. The right lung and abdomen were negative.

The temperature was 98.6°F, the pulse 80. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,950,000 with 75 per cent hemoglobin, and a white-cell count of 16,200 with 91 per cent polymorphonuclears. The sputum showed numerous polymorphonuclears, a few hemolytic streptococci, numerous alpha-hemolytic organisms, *Neisseria catarrhalis* and *Hemophilus influenzae*.

An x-ray of the chest showed homogeneous dullness obliterating the entire left lung field. The heart and mediastinum were displaced toward the left, and the only air in the left chest was apparently within the herniated portion of the right lung. The left main bronchus was not seen, but the right was quite distinct. The ribs on the left side were markedly thickened, particularly along the axillary line. The ribs were otherwise normal. The gas bubble in the stomach was at the level of the tenth rib. The right lung was clear.

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES. In the first film the obvious findings are the complete dullness on the left side of the chest, the absence of the heart shadow on the right and a somewhat emphysematous right lung. In the lateral view the posterior half of the chest seems to be fairly normal, and that would place the dullness in the upper rather than the lower lobe. This dark area is probably due to a herniation of the right lung through the mediastinum. We have a number of films taken using a higher voltage and longer exposure to bring out the structure of the involved lung, and you can now see that the trachea is displaced toward the affected side and that the bronchus to that part of the lung is not well shown. We have the appearance of collapse of the left upper lobe without other evidence of cause.

DR. FREDERICK T. LORD. Does it account for the density?

DR. HOLMES. No, but I do not see any other explanation. It could be collapse or consolidation. I do not believe it is encapsulated fluid.

DIFFERENTIAL DIAGNOSIS

DR. LORD. With respect to the history we have hemoptysis out of a clear sky and that means one of only a few possibilities, tuberculosis is first, cancer second, and the third might be one of the

following bronchiectasis, which rarely gives rise to hemoptysis out of a clear sky, rupture of a lymph node into the air passages, syphilis of the trachea and bronchi, and in other parts of the world, *Distoma vivax* and echinococcus disease. It seems obvious that this patient has a bronchostenosis. The history, physical examination and x-ray are all consistent with it. The physical signs are not distinctive but are wholly consistent with a bronchial obstruction. One may go further and say that in addition to bronchostenosis he has a disturbance in the part of the lung distal to the obstruction. One cannot know exactly what the nature of that disturbance is, but at least it is fair to say that he has atelectasis and he has had attacks of bronchopneumonia, doubtless due to trapping of infection. He probably has chronic inflammatory changes in the affected region and perhaps bronchiectasis or abscess.

The important matter to decide is why he had bronchostenosis. There are a good many causes of bronchostenosis. In the first place a foreign body is a very common cause. It has to be remembered that his disturbance started at the age of fifteen. He could have had a foreign-body inhalation and not have been conscious of it, but this is not a typical history because we do not expect hemoptysis as a presenting symptom out of a clear sky. So I am not inclined to think it is a foreign body which might be radiotranslucent so that one would not find it on x-ray film. It might be stricture from an inflammatory process and resulting scar tissue, but again we do not expect it to give this history of bleeding. I am not inclined to think seriously of it.

He might have syphilis of the trachea and bronchi. Syphilis of the bronchi is rare but does occur and may give rise to just such a disturbance as this, with bronchial obstruction and secondary changes in the affected region. However, one would expect other indications of tertiary syphilis.

Tuberculosis has to be considered. There was one apparently positive sputum but subsequent examinations were said to be negative. No mention is made of a search for tubercle bacilli in the sputum in this hospital. Do we know about that?

DR TRACY B. MALLORY: I can find no record of the sputum.

DR LORD: There is still another possibility. It is most likely that this is a new growth in spite of the fact that it began at fifteen. Without bronchoscopy it is almost never possible to be certain of the nature of bronchial obstruction, but one could guess at what this might be, and I should feel that tumor was the most likely possibility. In view of the long duration and the maintenance of good general health, adenoma of the bronchus—a benign new growth—is most likely. How-

ever, one would want a bronchoscopy under these circumstances to tell more nearly the nature of the obstruction.

DR MALLORY: We stopped this case short before the bronchoscopy because in cases of this sort bronchoscopies often give us the complete answer. I think it did here. Perhaps Dr. Tobey will tell us about it.

DR HAROLD G. TOBEY: I was interested to see in the record that early in the disease this patient developed a wheeze that apparently disappeared later when his obstruction became more complete. It is surprising that the diagnosis of asthma was not made at some time or other. A tumor in the bronchus, as it enlarges, very often causes an expiratory wheeze for some period of time.

As for the history of his bronchoscopies, he had one before he came here. I do not know what the diagnosis was at that time. At bronchoscopy here, the left main bronchus, beginning about 10 cm from the carina, was completely filled with a soft mass which bled very freely. At the first session we removed a large mass which we supposed to be tumor, but as I understand it, it was nothing but granulation tissue. The idea of these repeated bronchoscopies was to clear the left main bronchus. At the second bronchoscopy another large mass of tissue was removed, some of which was blood clot, but one fragment of tumor was obtained. At that time the remaining mass was coagulated with diathermy. Still we were unable to demonstrate the left upper lobe bronchus.

At the last bronchoscopy still more tissue was removed and while we did not demonstrate to our satisfaction the opening of the left upper lobe bronchus, I am sure we did get below it, diathermy was used again. I went away from Boston at that time but the understanding was that bronchoscopies should be continued. It hardly seems possible that after a period of eight years with this increasing obstruction we shall be able to clear the bronchus enough to enable the lobe to fill out again and become completely aerated.

PREOPERATIVE DIAGNOSIS

Benign adenoma of the bronchus

DR. LORD'S DIAGNOSIS

Probable adenoma of the bronchus

ANATOMICAL DIAGNOSIS

Adenoma of the bronchus

PATHOLOGICAL DISCUSSION

DR MALLORY: Two out of the three bronchoscopy specimens showed tumor. This tumor was very characteristic histologically of what we have

been calling bronchial adenoma. What the tumor actually is, is very far from certain, but histologically it looks much more like the carcinoid tumors that we see in the intestinal tract, especially in the appendix, than like any other tumor. Its relation to carcinoid is rather borne out by its clinical behavior. It is extremely slowly growing and very late to metastasize, and yet from the histologic point of view is very apt to be invasive. One of our cases has metastasized to one of the bronchial nodes. In the other cases that we have had a chance to examine the bronchial nodes have been negative. In most cases, however, there has been a slight degree of invasion of the bronchial wall so that the tumors cannot be classified as benign. They are the lowest possible grade that you can call malignant. The problem of how to treat them is a very real one. The duration of the disease or the length of time which will elapse before you may expect metastasis is so great that one hesitates to be too radical. But the tumor is a lethal agent not directly from its neoplastic qualities but secondarily because of plugging of the bronchi and infection and eventual destruction of the distal lung tissue. So unless the bronchi can be kept clear one may assume the patient will die from pulmonary infection.

We have experimented with different kinds of treatment, but I believe the Thoracic Clinic has not yet decided what is the wisest thing to do. I shall ask Dr King to tell us about that.

DR DONALD S KING: Five lines of treatment were possible in this case: first, removal of the tumor through the bronchoscope, secondly, x-ray treatment, thirdly, radium treatment, fourthly, total pneumonectomy, fifthly, leave well enough alone. In spite of the fact that the patient had had very few recent symptoms, it was probable on the basis of our experience that there was extensive suppuration in the atelectatic lung, and that removal of the permanently damaged lung would be the best procedure. However, Dr Churchill believed that extensive adhesions would make removal extremely difficult and hesitated to operate. The next question was as to the implantation of radium seeds, but Dr Holmes believed that he could deliver at the site of the tumor as much radiation by x-ray as would be given by radium and with less danger to the surrounding tissues. X-ray treatment was therefore given, and after a proper interval another bronchoscopic examination was made. The tumor mass was found to be still present, but the histologic changes in the biopsy specimen are of interest.

DR MALLORY: The final biopsy showed the architecture of the tumor pretty clearly but a very small number of viable tumor cells. On the other hand the experiment is not clear cut because Dr Tobey also used diathermy. I cannot say whether

it was diathermy or radiation, but something seems to have killed a good many tumor cells.

DR KING: The next procedure was to attempt removal through the bronchoscope of the tissue which was still obstructing the bronchus. Several bronchoscopies were done, and a good deal of tissue removed. We have not seen the patient for a month, and I am not sure of his present condition.

DR HOLMES: The radium treatment was not so much my idea as that of Dr Belsey. He had spoken of other cases he had seen treated with radium.

DR MALLORY: In London I understand they have been using radium in a special container. Perhaps Dr Belsey would speak of that for a moment.

DR RONALD R BELSEY: At the Brompton Hospital, London, these cases are now being treated by the application of radon seeds to the tumor. Twelve 1.25 millicurie seeds are distributed evenly within the jacket of a tubular platinum container designed by Dr Tudor Edwards. The container is canalized to maintain patency of the bronchial airway, is placed alongside the tumor through the bronchoscope, is maintained in position by a spring for seven days and is then removed.

Six cases treated in this way have been followed bronchoscopically, in 4 there was, at the last observation, no macroscopic evidence of tumor, and in 2 the tumor was greatly diminished in size. In no case did biopsy reveal the persistence of tumor cells. In 2 cases where the bronchus was completely occluded by growth, preventing the introduction of the container, the radon seeds were implanted directly into the tumor with subsequent canalization of the bronchus.

CASE 24092

PRESENTATION OF CASE

A fifty-year-old American housewife was admitted complaining of fever.

The patient was perfectly well until six weeks before entry, when she developed a fever and a rash on her arms, legs and buttocks which was painful to touch and consisted of red, slightly elevated, circular lesions, distributed closely together, and varying in size from 1 to 6 cm in diameter. She went to bed on the first day of the rash, not because of feeling ill but because of the pain she suffered. The acute stage of the rash lasted four or five days and then the lesions began to fade slowly. However, she remained in bed up to the time of entry because of continued fever. She had no other complaints except moderate malaise, some weakness, and a slight cough. She stated that in the past she had been bothered by hot weather and that her symptoms began just after two very hot days.

Except for pneumonia when she was very young, she had had no serious diseases and had had no medical attention since her marriage. She had no weight loss previous to her present illness and no hemoptysis or other symptoms except for slight cough. Her father died of tuberculosis eighteen years previously. One sister died of tuberculosis at the age of twenty-one, and a brother died of it five or six years previously. The patient had not been exposed to tuberculosis after her father's death. A sister died of peritonitis at the age of eighteen. Her mother and five other siblings were living and well.

Physical examination showed a fairly well-developed, somewhat emaciated, chronically ill woman breathing rapidly. There were small discrete hyperkeratotic spots on the exterior surfaces of the arms. The skin was rough and dry, and there were many areas of brown pigmentation on the trunk. There was a walnut-sized node in the left axilla. The chest showed slight splinting of the right side. There were areas of bronchovesicular breathing and fine to medium crepitant rales, with dullness over the lower half on the right and the lower third on the left posteriorly and laterally. The voice sounds and tactile fremitus in these areas were slightly increased. The heart sounds were of poor quality, and there was a distinct gallop rhythm. A_2 was greater than P_2 , and the pulse was weak. There was generalized tenderness of the abdomen. The blood pressure was 90 systolic, 58 diastolic.

The temperature was 100.4°F , the pulse 112. The respirations were 24.

The urine had a specific gravity of 1.010, and a very slight trace of albumin, normal sediment, and no Bence-Jones protein. The blood showed a red-cell count of 4,290,000 with a hemoglobin of 75 per cent. The white-cell count was 5300 with 76 per cent polymorphonuclears. A blood culture contained diphtheroids. Widal and undulant fever agglutinations were negative. The blood gave a total protein of 4.2 gm and a nonprotein nitrogen of 78 mg per cent. The sedimentation rate was 0.52. The blood sugar was 182 mg per cent. Five sputum examinations were negative for tuberculosis. An electrocardiogram on the second day showed diphasic T_1 and T_2 and a P-R interval of 0.20.

An x-ray of the chest showed multiple small areas of calcification at both apices and throughout the left midlung field. The right diaphragm was high, and the right costophrenic angle was obliterated. The long bones showed no evidence of disease.

On the second day her temperature rose to 102°F and for the next three days fluctuated between 100 and 103° . Her pulse remained rapid, and

her respirations rose to 40. On the third day a dry pleural rub was heard in the right axilla and posteriorly, which, however, disappeared in the next twenty-four hours. An electrocardiogram on the fifth day showed a P-R interval of 0.19, low T_1 , diphasic T_2 and T_3 , and a low origin of T_4 with low voltage, suggesting poor myocardial function. A blood culture taken that day was negative. The temperature rose rather abruptly to 105°F and was maintained at that level, with a gradual fall to 103°F at the time of death. On the sixth day the patient developed unilateral edema with increased warmth of the left leg. Marked abdominal distention was relieved by an enema. The lungs were filled with fine crackling rales at the bases and coarse rhonchi elsewhere. On the sixth day the white-cell count was 3300 with 72 per cent polymorphonuclears. She developed a coarse tremor of both arms. On the ninth day a portable chest plate showed consolidation of the lower three quarters of the left lung field. Her condition remained relatively unchanged, and on the eleventh day she died.

DIFFERENTIAL DIAGNOSIS

DR DONALD S. KING: There is one possible diagnosis which recurred so constantly as I read through this record that I cannot refrain from making it. However, the condition is unusual, and although on paper the diagnosis may seem clear, I am almost afraid to make it.

We will let Dr. Holmes take up the x-rays first.

DR. GEORGE W. HOLMES: In the first film there is evidence of tuberculosis of both apices. The shadows are very sharp. It looks as if it were an old process and probably not active. She has an elevated diaphragm on the right side and some increase in the hilus shadows. I do not see the cause of the high right diaphragm unless there is an occluded bronchus running to that area. We have no films in expiration and no lateral view to help us. Eight days later she has a marked change on the left side. I should like it much better if it were on the right side. On the left side now there is an area of consolidation which extends up to the second rib in front, which does not obliterate the outline of the heart or displace it, and which does not obliterate the outline of the diaphragm. I should think it was a pneumonic type of process and not fluid. The high position of the diaphragm on the right has disappeared. It is now nearly normal. In the last film, taken two days after the second, the process is still present and of about the same size.

She has positive evidence of a rather extensive, old, tuberculous infection of the lung. We have not much evidence as to what the acute process is

DR. KING You would not necessarily call this new process tuberculosis?

DR. HOLMES It is a pneumonic process. It could be tuberculous pneumonia.

DR. KING On the basis of the x-ray findings in the lungs, I am willing to throw out a primary lung infection as the cause of this patient's eight weeks of fever and other symptoms. When she came into the hospital, there was no x-ray evidence of active pulmonary disease. On the ninth hospital day, she developed a pulmonary lesion which from the x-ray standpoint, can be terminal pneumonia. Therefore, I do not believe that a lung infection was responsible for her symptoms during the entire eight weeks.

Let us review the facts so that you can see the picture that I have in mind. The patient is a woman of fifty. Fifty years is a little old for the condition, but by no means rules it out. The sex is right. The symptoms began after a hot day. We do not know that she had been exposed to sunlight, but it was in the summer and we have a right to assume that she may have been. There is a strong family history of tuberculosis which is said to be present in a majority of the patients suffering from the disease which I am considering. Whether tuberculosis is the cause of this disease no one has been able to prove, but it is very frequently associated with it. There is evidence of a cardiac lesion probably located in the myocardium. This is also a characteristic accompaniment of the condition. Whether, in this case, endocarditis is present, we cannot say. More than 50 per cent of the autopsied cases reported have shown endocardial changes but not true bacterial endocarditis. In the present case, the kidneys are involved, since the nonprotein nitrogen was 78 mg per cent. However, there is no report in the urine of red cells or casts. So far as the lungs are concerned, we have terminal pneumonia and scattered lesions which could be of vascular origin. There was also a pleural rub, but no evidence of pleurisy with effusion or pericardial effusion, both of which occur frequently. Finally, there is a definite leukopenia in two counts after hospital admission.

Now there is a disease, occurring especially in women, with prolonged fever and leukopenia, with recurring skin lesions brought out by exposure to the sun, and accompanied by vascular lesions in the heart, lungs and kidneys. How can I refrain from diagnosing the present case as lupus erythematosus disseminatus?

But there are some points which are not typical. In the first place, the skin lesions are not the characteristic lesions of lupus erythematosus, which usually persist longer and are apt to be prominent about the fingernails. In the second place, the urine does not show the characteristic changes,

nor was there definite fluid—pleural, pericardial or in the joints.

There is one final argument for my diagnosis namely, that I went this morning to the Treadwell Library to find the volume of the Transactions of the Association of American Physicians in which Dr. Baehr describes 23 autopsied cases of the disease, and found that the book had been taken from the library by Dr. Mallory.

What else can the diagnosis be? Of course, one thinks of erythema nodosum and the skin lesions described are certainly consistent. A terminal tuberculous process might come after erythema nodosum, but this seems to me very unusual in a woman of fifty with fever for eight weeks and acute lung lesions which did not develop until shortly before her death. What other conditions can give skin lesions and fatal pulmonary involvement? Various yeast and fungus infections may give these, but we have no evidence for such a diagnosis. How about bacterial endocarditis? We have the persistent unexplained fever but no other evidence. It is obvious that the men who were taking care of the patient had thought of lymphoma and multiple myeloma and had ruled these out so far as it could be done. There is no evidence for periarteritis nodosum. I cannot make any diagnosis that suits me as well as lupus erythematosus disseminatus.

DR. WYMAN RICHARDSON I have an idea that perhaps too much emphasis has been put on the skin lesions. They lasted only four or five days so far as I can see from the history.

DR. TRACY B. MALLORY They were certainly gone at the time of autopsy.

DR. WALTER BAUER They were not characteristic of lupus.

DR. RICHARDSON The description sounds like erythema multiforme, and I wonder if she may not have tuberculosis of the adrenal glands with pulmonary infarcts to account for the lung picture. The hot-day argument comes in there also, you get hypotension, and many of these findings could be due to adrenal failure.

DR. KING I think my picture is better. If you read the descriptions in the literature, it is perfect. That is the trouble, it is too good.

DR. RICHARDSON Can you have disseminated lupus, sine lupus?

DR. KING Yes, with no skin lesions at all, or with lesions that come and go quickly. I looked up the descriptions of the skin lesions of disseminated lupus, and I think they fit this case.

DR. MALLORY It is unfortunately very nearly impossible to give in words a description of skin lesions that is of much use to anyone. Dr. Bauer was in charge of this patient and he can tell us a little more.

DR BAUER I personally do not think that these skin lesions described are consistent with what we think of as the skin lesions of lupus erythematosus disseminatus. They really are more like erythema nodosum.

When this woman entered the Baker the thing that I wondered about most was whether the skin lesions, which had disappeared, represented an erythema nodosum, and in view of that, whether we were dealing with an individual who had a very severe rheumatic fever, which could explain the whole picture. Knowing that erythema nodosum is also seen in association with tuberculosis, the only other possibility that I could entertain very seriously was that of miliary tuberculosis. I was unable to go any farther than that. I wanted very much to make a diagnosis of rheumatic fever. Before the autopsy I said I should put rheumatic fever first, miliary tuberculosis second, and the question of lymphoma as a distant third, but I really thought the diagnosis lay between very severe rheumatic fever and miliary tuberculosis.

DR KING But you had no real evidence for rheumatic fever, except the unexplained fever?

DR BAUER We had the heart findings which could indicate serious damage to the myocardium, skin lesions which we interpreted as probably being erythema nodosum, and the possibility that the pneumonic infection was a rheumatic pneumonia. I tried hard to make another diagnosis, but I always kept coming back to rheumatic fever. I think I really wanted for once to make a diagnosis of severe rheumatic infection in a woman of this age and thought I had a fair amount of evidence in its favor. When I came to the autopsy room, however, I put miliary tuberculosis first and rheumatic infection second.

DR MALLORY As I read over the story this morning I must acknowledge that I, too, thought of Dr King's diagnosis first.

DR BAUER She never had anything in the kidneys to indicate an active nephritis.

DR KING She had a nonprotein nitrogen of 78.

DR BAUER Yes, at the end.

DR MALLORY I think one should always be cautious about interpreting evidence of renal failure in the terminal stages of a patient's illness. I believe if we took more nonprotein nitrogens the day before death we might get a great many over 80.

CLINICAL DIAGNOSES

Rheumatic fever
Miliary tuberculosis?
Lymphoma?

DR KING'S DIAGNOSIS

Lupus erythematosus disseminatus

ANATOMICAL DIAGNOSES

Pulmonary tuberculosis, chronic, with cavitation
Acute miliary tuberculosis
Tuberculous peritonitis
Pulmonary embolism and infarction
Bronchopneumonia
Thrombosis of left iliac vein
Arteriosclerosis, moderate

PATHOLOGICAL DISCUSSION

DR MALLORY At autopsy we found a diffuse miliary tuberculosis and a tuberculous peritonitis. The peritonitis was the most impressive of the lesions. Every millimeter of the peritoneum was studded with minute, very young tubercles. The heart was entirely negative except for questionable thickening of the endocardium of the left ventricle overlying the septum. The kidneys also were negative. We found an old tuberculous cavity in the left lung and scars of tuberculosis in both upper lobes. So far as the gross appearance of the lung lesions was concerned, we could not make out any evidence of activity. It is not surprising that they saw none by x-ray. The more acute process in the lungs was not tuberculosis but was a combination of multiple infarcts and pneumonia. She had infarcts scattered throughout all five lobes and a large area of pneumonia in the left lower lobe. The source of the emboli was a thrombus of the left iliac vein, which had been the cause of edema of the left leg.

DR RICHARDSON What about the adrenals?

DR MALLORY They were negative.

DR HOLMES Where was the cavity in the left lung?

DR MALLORY It was 3 cm down from the apex in the left upper lobe. It was quite a big cavity, 3.5 cm in diameter.

A PHYSICIAN Did she have meningitis?

DR MALLORY We did not examine the head.

DR JOHN D STEWART Was the walnut sized node tuberculous, too?

DR MALLORY I do not believe we looked for that, however, her peripheral lymph nodes showed tuberculosis.

A PHYSICIAN Do you think the skin lesions were miliary tuberculosis?

DR MALLORY No, I do not think they could have been. My best guess is erythema nodosum which you get with either rheumatic or tuberculous infection. Do you agree, Dr Goodman?

DR JOSEPH GOODMAN Yes.

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WHEN IS A PROFESSION NOT A PROFESSION?

THE nature of a profession is such that it is impossible of determination by material standards. One always comes back to a criterion which in some way embodies the spirit of the profession. It is difficult to define this spirit, but without further specification we may contrast it with the commercial spirit as an approximation sufficiently close to definition for the present purpose.

Recently the Supreme Court of Massachusetts handed down an opinion in which optometry is characterized as a profession. The case involved as one defendant a physician whose license had been revoked within the year for association, in the practice of medicine, with an unlicensed person, and seems to have had to do with the same

acts for which the physician lost his license. A transcript of the decision appears elsewhere in this issue of the *Journal*.

The Court weighed the evidence for and against the professional status of optometry and decided that "the placing of optometry on a professional basis" was not arbitrary or irrational. It also expressed the view that professional status is incompatible with the status of a servant. The physician in this case, as employed by the layman, became his servant. How far is the opinion justified in denoting optometry as a profession?

Under the definition of optometry as it once appeared in the statute, the optometrist measured the powers of vision of the human eye and adapted lenses for the aid of vision. Under the definition now in the statute, the field for the optometrist has been much extended and the Court thinks that "the work of an optometrist approaches, though it does not reach, ophthalmology." But the optometrist does actually adapt lenses for the aid of vision and sells spectacles, eyeglasses and lenses for the purpose of correcting vision. In this vending of mechanical devices, the optometrist competes with the optician, in trade, on his own ground. Also, contrary to the usual practice of a profession, an optometric practice may be carried on by the unregistered spouse of a registered practitioner. Is optometry then a profession or a trade? The question is worded in accordance with a type of logic much discredited of late, "either—or." The implications are that optometry is either a profession or a trade, it cannot be both, for a profession and a trade are mutually and reciprocally exclusive. The facts of life often ruin our logic as in this case.

In one part of his work the optometrist is as commercial as the optician, no more and no less. In another part of his work, and this insofar as he is practicing medicine, he is professional. It is sometimes contended that since the legislature has provided for the separate licensing of optometrists, it has taken optometry out of the field of medicine. But it is not in the power of the legislature so to do: an act of legislature can only delimit the legal and the illegal. The induction of an abortion is

the practice of medicine no matter who performs it. How much of the work of the optometrist is professional and how much is trade, it may not be possible to determine easily. The proportions may vary. It is known that often the physician, as in the present case, is paid one dollar for each examination of the eyes, and that nine dollars is a fair average price for the glasses sold to the patient by the optician. Perhaps it is not just to judge the optometrist by this standard—ten per cent professional and ninety per cent commercial—but it is still true that "Where your treasure is, there will your heart be also."

If one examines the statutes concerning dentistry, one finds that, from this point of view, it also is not wholly a profession. The law specifically permits corporation practice of dentistry. Is there any other branch of medicine in which this is possible? Generally corporation practice of a profession is held to be highly improper. Sections 49 and 52 of Chapter 112 of the General Laws use the term "corporate" and "corporation" and Section 53 of the same chapter says further "Nothing in sections forty-three to fifty-two inclusive shall

prevent the widow, executor or administrator of a registered dentist who has died, or the wife of one who is incapacitated, from continuing his business under a registered dentist." It is impossible to reconcile this with the opinion of the Supreme Court that the personal relation between physician and patient is to be regarded as the essence of the profession.

There is a permanent tendency in human nature which works toward the commercialism of professions. It is seen in all of them. It has strong influence in medicine today, even in the main stream where as yet it has received little if any statutory support, and in some of the subsidiary branches it seems to be advancing rapidly.

For various reasons, summarized in the statement that "national health is the greatest national asset," interest in health has become far more widespread than fifty years ago. Preventive medicine is almost the order of the day. Insurance companies, industrial concerns, educational institutions, all have their health programs and render

some form of health service by employing physicians. None of these corporations are eleemosynary in the strictest sense, and some are organized purely for profit. To what extent are they commercializing medicine? Are not hospitals in some cases exerting a subversive influence by their apparently commercial practices?

It is a fact that the practice of medicine has become far more commercialized than is generally recognized. When commercialism becomes dominant, medicine is in danger of losing completely its professional standing. It is the duty of the medical profession to set its house in order. The undertaking is difficult and not without danger. For it, medical statesmen are needed as leaders, and behind and supporting them, an enlightened and united profession.

We need a fresh vision of the deep underlying unity of the healing art, a keener sense of the responsibilities of what may become for all of us a noble profession, and a determination to prevent, and so far as may be, to remove, the stains which commercialism has smeared over the surface. It has not yet touched the heart of the profession. The deeply rooted antagonism between the spirit of a profession and the spirit of commercialism lies in the difference of their aims. The ideal of a profession is the beauty of an esthetic achievement. This the commercial spirit seeks to destroy.

BORROW 175,000 BOOKS FOR \$15!

SUCH an offer suggests the prospectus of a loan shark rather than the duly authorized privilege of any member of the Boston Medical Library in return for yearly payment of dues. Yet the recent annual report of the Librarian of this institution expresses regret that the Library is not more used by its members. What, then, is the reason for this apparent apathy on the part of medical readers?

The evidence suggests that it is not because of inadequate facilities or service on the part of one of the leading medical libraries of the world. The Library offers to its members an unusually comprehensive collection of current periodical literature, as well as standard reference books. Well

over half of the volumes in the Library are not to be found in any other library in Greater Boston. Unusual items may be quickly obtained from the Surgeon General's Library in Washington. Quiet cubicles where members may keep books ready at hand assist scholarly effort. Moreover, the service rendered by the Library is by no means confined to its own premises. Professional memberships in the names of various hospitals and medical schools in Greater Boston allow the staffs of such institutions the use, within the library so affiliated, of any book in the Boston Medical Library. Through the professional memberships of their own institutions, members of the Boston Medical Library may borrow books for use outside of the affiliated library. Inter-library loans afford a service to medical libraries in all parts of New England.

On the other hand, as an explanation of the fact that the use of the Boston Medical Library has increased only slightly during the past year, it cannot be supposed that the profession consults the medical literature less often than in the past. The apparent lack of readers at the Library is probably explained by the increase in facilities for the perusal of the medical literature afforded elsewhere. Thus, as is highly desirable, many of the medical readers of today can turn for their immediate needs to the library of the hospital or medical school with which they are affiliated. Nevertheless, if the necessity for providing adequate financial support for the Boston Medical Library should be lost sight of, almost irreparable injury would be done. Within reason, no amount of development of the smaller libraries of the community can substitute for the vast collections quickly available at the larger institution. This Library is thus an institution with an importance common to all physicians, irrespective of their academic or professional affiliations. By joining, the individual subscriber clearly obtains full value for his dues, and in addition has the satisfaction of knowing that he is contributing to one of the basic resources of the medical profession of Boston and New England.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 61 PARTIAL PLACENTA PREVIA

Mrs. A., a white multipara, aged thirty-two years, had a painless hemorrhage of about 200 cc. of fluid blood in her physician's examining room while she was disrobing preparatory to a routine examination at eight months. She was sent to the hospital immediately.

There was no family history of tuberculosis, diabetes, cancer or hemorrhagic disease. She had had measles and scarlet fever as a child, and her appendix had been removed four years before. She was subject to occipital headaches and had occasional attacks of tonsillitis.

Her catamenial history was normal, with a twenty-eight-day cycle. Two previous pregnancies had terminated in low-forceps operations, and these two children were alive and well. Both pregnancies had been complicated by a mild toxemia without convulsions. The date of her last period was May 19, making the expected date of confinement February 26. She had been seen three times previously in this pregnancy, and at each visit her blood pressure had been found a little above normal. On January 27, the day of the hemorrhage, her blood pressure was 145 systolic, 90 diastolic.

At the hospital her examination showed a normal temperature, with a pulse of 88. Her heart was not enlarged, and there were no murmurs. Her lungs showed no abnormalities. The uterus was symmetrically enlarged, with the fundus about three fingerbreadths below the ribs. The fetus was in ODA position with a steady fetal heart rate of 128 and sounds of good quality. Active bleeding had ceased by the time she arrived at the hospital. The urine showed no albumin.

Two diagnoses were of course brought to mind—placenta previa and partial detachment of a normally implanted placenta from toxemia. It was deemed best not to examine the patient vaginally at once, and no more bleeding occurred during the next five days.

At the end of this time she was taken to the delivery room. Everything was prepared for imme-

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

dite delivery, if necessary, and also a sterile bagging set was on hand. Vaginal examination revealed a placenta previa, with the edge of the placenta just inside the cervix on the left side. The fact that the patient was a multipara with a soft, partially patulous cervix seemed to indicate that delivery from below was the method of choice, and a No. 6 Voorhees bag was inserted into the uterus and filled with sterile water. In the process, some bleeding was encountered because the membranes over the os were very tough and would not rupture after ordinary methods were used. The bag was therefore inserted on the right side of the uterus without rupturing the membranes. The fetal heart maintained a steady rate of 140 throughout.

The bag was inserted at 11 a. m. and at 7 p. m. no progress had been made. There were mild, irregular contractions of the thirty-second variety which did not complete the taking up of the cervix. There was a slight ooze alongside the bag in spite of increased weight being applied to it. The patient was showing signs of fatigue, and the pulse had risen from 80 to 100.

A second attempt to rupture the membranes was deemed advisable. A second bagging set was prepared. After removal of the first bag from the uterus, the membranes were again attacked. The sharp point of the scissors failed to go through, and in exerting the necessary pressure, the hemorrhage became of alarming proportions. Fortunately the cervix was soft and readily responded to attempts at dilatation, and the membranes were finally ruptured by attacking them inside the uterus. The placenta was explored and found to be detached over a considerable area. The Braxton-Hicks procedure was immediately decided upon. A leg was easily found and pulled down through the cervix. Traction on the leg seemed to check the hemorrhage. While preparing to put a weight on the leg, it was noticed that the necessary traction was causing the baby to dilate the cervix. The descent continued until the buttocks were in the vagina when it was decided to deliver the baby immediately. The subsequent delivery was very easy, and the baby, who weighed 7 lb., cried at once. The placenta followed the baby before the cord could be cut.

The cervix was inspected and found to be lacerated in the median line anteriorly. The laceration extended 10 cm. beyond the vaginal vault. This was brought together with a suture which passed through the vaginal mucosa, and the cervical laceration was repaired. There was no other cervical laceration. On account of a slight but continuous ooze the uterus and vagina were packed with gauze.

The husband had been found to be a compatible donor, and a transfusion of 500 cc. of blood was given by the Vincent method. This brought the pulse rate from 140 to 120.

Three hours after the delivery, the pack had shown no signs of staining, and the patient was returned to her room. Fifty minutes later the patient had a sudden severe pain in the lower abdomen and expelled a large amount of fluid blood. The pulse rose immediately to 150, and the patient again showed pallor and some shock.

The diagnosis of rupture of the uterus was made, and the patient was immediately prepared for abdominal operation. On opening the abdomen a hematoma, the size of a hen's egg, was found beneath the peritoneum and a little to the left and just above the cervix. Blood had also invaded the left broad ligament. The uterine muscle in the region of the placental site was friable and torn transversely. The peritoneum, however, was intact. The split above the cervix was successfully closed by the suture inserted at the time of the delivery. A supravaginal hysterectomy was done, 2000 cc. of glucose in saline and a 500 cc. transfusion of blood were given during the operation.

The patient ran an uneventful convalescence, and both mother and baby were discharged well on the twentieth postpartum day.

Comment. This case presents several unusual features. It was the unusually tough membranes that started the train of events that ended in hysterectomy. Rupture of membranes should always precede the insertion of a bag in placenta previa. The distention of the bag undoubtedly detached some of the placenta when the bag was filled and did not exert pressure properly against the placenta, as evidenced by the leaking while the bag was in place.

It is also unusual for a bag to fail to start labor in eight hours in a case where the cervix is soft and patulous. With the lack of labor plus a rising pulse and leakage of blood, it seemed imperative to make endeavors which would bring on labor and correct the leakage, if possible.

The cervix was so unusually soft and dilatable in this case that ordinary traction on the leg of the baby after the version caused it to dilate. In all probability the rupture of the cervix occurred when the head was forced through it by supra pubic pressure, although this pressure did not seem excessive.

The cause of the sudden severe pain in the lower abdomen four hours after delivery, followed by the large hemorrhage, is not clear, unless it marked the time when the subperitoneal hemorrhage occurred. It is possible that a very strong contraction of the uterus, resulting from the irritation of the gauze pack, may have torn the lower uterine segment in the region of the placental site, and that this injured the larger blood vessels. The shredding of the placental site found at operation probably occurred when the head was forced through the cervix, and the contraction of the uterus later added further damage.

ANNUAL MEETING

THE one hundred and fifty-seventh annual meeting of the Massachusetts Medical Society will be held at the Hotel Bradford, May 31, June 1 and 2.

The Shattuck Lecture will be given on Tuesday, May 31, by Dr. David Riesman, emeritus professor of clinical medicine and professor of the history of medicine at the University of Pennsylvania School of Medicine. His subject will be 'Superstitions, Cults and Neuroses.'

MEDICAL POSTGRADUATE
EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning March 7.

BARNSTABLE

Sunday, March 13, at 4:00 p. m., at the Cape Cod Hospital, Hyannis. Subject: Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor: R. Earle Glendy. John I. B. Vail, *Chairman*.

BERKSHIRE

Thursday, March 10, at 4:30 p. m., at the House of Mercy Hospital, Pittsfield. Subject: Pneumococcus Pneumonia and Serum Therapy. Instructor: Frederick T. Lord. Melvin H. Walker, Jr., *Chairman*.

BRISTOL SOUTH (Fall River Section)

Monday, March 7, at 4:30 p. m., at the Union Hospital, Fall River. Subject: Atelectasis in the Newborn. Instructor: Clement A. Smith. Howard P. Sawyer and Robert H. Goodwin, *Chairmen*.

ESSEX NORTH

Friday, March 11, at 4:00 p. m., at the Lawrence General Hospital, Lawrence. Subject: Atelectasis in the Newborn. Instructor: Warren R. Sisson. John Parr, *Chairman*.

ESSEX SOUTH

Tuesday, March 8, at 4:00 p. m., in the Nurses Home, Salem Hospital, Salem. Subject: Gonorrhea in the Male. Instructor: George C. Prather. Walter G. Pluppen, *Chairman*.

FRANKLIN

Wednesday, March 9, at 8:00 p. m., at the Franklin County Hospital, Greenfield. Subject: Differential Diagnosis and Treatment of Scarlet Fever. Instructor: Edwin H. Place. Halbert G. Stetson, *Chairman*.

HAMPSHIRE

Thursday, March 10, at 4:00 p. m., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8:00 p. m., in the Outpatient Department of the Skinner Clinic, Holyoke Hospital, Holyoke. Subject: Rheumatic Infection, Rheumatic Heart Disease. Instructor: T. Duckett Jones. George D. Henderson and George L. Schadt, *Chairmen*.

HAMPSHIRE

Wednesday, March 9, at 4:15 p. m., in the Nurses Home, Cooley Dickinson Hospital, Northampton. Subject: Early Syphilis. Instructor: Rudolph Jacoby. Warren P. Cordes, *Chairman*.

MIDDLESEX EAST

Tuesday, March 8, at 4:00 p. m., at the Melrose Hospital, Melrose. Subject: Toxemias of Pregnancy. Instructor: John Rock. Joseph H. Fay, *Chairman*.

MIDDLESEX SOUTH

Wednesday, March 9, at 4:00 p. m., at the Cambridge Municipal Hospital, Cambridge Street, Cambridge. Subject: Bleeding in the First Trimester of Pregnancy. Instructor: John Rock. Edmund H. Robbins, *Chairman*.

NORFOLK

Friday, March 11, at 8:30 p. m., at the Norwood Hospital, Norwood. Subject: Cesarean Section, Analgesia. Instructor: M. Fletcher Eades. Hugo B. C. Riemer, *Chairman*.

PLYMOUTH

Tuesday, March 8, at 4:00 p. m., in the Rosa Field Nurses Residence, Brockton Hospital (rear of hospital), Brockton. Subject: Complications in Obstetrics Illustrated by Case Histories. Instructor: James C. Jannetty. Walter H. Pulsifer, *Chairman*.

WORCESTER (Milford Section)

Thursday, March 10, at 8:30 p. m., in the Nurses Home, Milford Hospital, Milford. Subject: Acute Anterior Poliomyelitis—Its Diagnosis and Treatment. Instructor: R. Cannon Eley. Joseph Ashkins, *Chairman*.

DEATHS

DAY—CHARLES ORIN DAY, M.D., of Boston, died February 23. He was in his fifty-ninth year.

Born in Williamsburg, he graduated from Yale University in 1903 and received his degree from the Harvard Medical School in 1907. He served internships at the Massachusetts General Hospital and at the Sloane Hospital for Women, New York City. Dr. Day had practiced in Hingham, where he was well known as an obstetrician, before coming to Boston as an ear, nose and throat specialist.

Among his affiliations were fellowships in the American Medical Association and the Massachusetts Medical Society. He was consulting surgeon at the Boston Eye and Ear Infirmary, the Boston Lying-in Hospital, the Florence Crittenton Leagues Hospital and the Brooks Hospital, Brookline. His clubs included the Harvard and Yale clubs of Boston.

A sister, Mrs. Robert Keep, of Farmington, Connecticut, survives him.

DEWING—LOUIS A. DEWING, M.D., of 31 Avon Street, Cambridge, died February 21 at his home. He was in his sixty-sixth year.

Born in California, he attended Harvard University in 1890 and 1891 and studied at Harvard Medical School in 1893 and 1894 before receiving his medical degree at the Medico-Chirurgical College of Pennsylvania.

Dr Dewing was a fellow of the American Medical Association and the Massachusetts Medical Society. His widow and a son survive him.

LOWE—FRED M. LOWE, M.D., of 1354 Washington Street, Newton, died February 28. He was in his eightieth year.

Dr Lowe was born in Lawrence, Kansas, and was graduated from Yale University in 1882 and from the Harvard Medical School in 1885.

For thirty years he was city physician of Newton prior to his retirement in 1935. He was a member of the Newton Hospital staff from 1902 until the time of his retirement. Dr Lowe was a member of the American Medical Association and a fellow of the Massachusetts Medical Society.

Two grandchildren in New York survive him.

QUIMBY—CHARLES M. QUIMBY, M.D., of 38 Pleasant Street, Gloucester, died February 25 at his home. He was in his sixty-ninth year.

A native of Hill, New Hampshire, he graduated from the Maryland Medical College in 1904. He served his internship at the Old Gloucester Hospital.

Dr Quimby was a fellow of the American Medical Association and the Massachusetts Medical Society.

His widow, two sons, three daughters and two sisters survive him.

MISCELLANY

1938 AMERICAN MEDICAL ASSOCIATION MEETING—SAN FRANCISCO

When San Francisco was selected as the host city for the 1938 annual session of the American Medical Association, the profession of this Golden Gate metropolis promptly initiated plans for the comfort, pleasure and entertainment of all who come to that national meeting. A local executive committee on arrangements composed of five members, with Dr Howard Moxrow as general chairman and Dr Frederick C. Warnshuis as general secretary, and eighteen subcommittees have been busy since July in developing plans and local arrangement details. Their objectives are the biggest, best and most memorable annual session in the history of the American Medical Association.

Atlantic City, Kansas City, Cleveland, Detroit, with their known facilities and attractions have been host cities in recent years, and have justified their selection as meeting places. However, and without disparagement, none of them possess the background, the setting, the resources, the history and romance, or the facilities that are found in San Francisco and in the great state of California—the Golden Bear Empire of the Pacific Coast. To reveal these, to extend California's and San Francisco's noted hospitality, and to cause those who plan to attend the 1938 session to experience ten days of profit and pleasure midst the environs of the annual meeting city, is the goal toward which the local profession is pointing.

The Local Committee on Arrangements cordially invites the profession of the country to be San Francisco's guests this coming June. Decide now to attend the 1938 American Medical Association meeting and plan accordingly. During the coming months an insight to some of the feature functions will be disclosed, but the final details and program of events will not be revealed until you arrive. You will long regret it if you fail to attend the coming national meeting. Talk it over tonight with the good wife and your professional associates, and join the party of

your state members that is coming to San Francisco—June 12 to 17, 1938.

NEW ENGLAND OTO-LARYNGOLOGICAL SOCIETY

The following were elected officers of the New England Oto-Laryngological Society at the annual meeting on Wednesday, February 16: president, Dr William Goodell, of Springfield, vice president, Dr Charles D. Knowlton, of Boston, secretary treasurer, Dr Philip E. Meltzer, of Boston, executive committee, Dr Frederick T. Hill, of Waterville, Maine, and Dr Lyman Richards, of Boston.

PHILIP E. MELTZER, M.D.,
Secretary-Treasurer

CORRESPONDENCE

PRACTICE OF OPTOMETRY

To the Editor Enclosed is a transcript of the decision recently handed down by the Supreme Court of Massachusetts relative to certain aspects of the practice of optometry. I believe it will be of interest to readers of the *Journal*.

STEPHEN RUSHMORE, M.D., Secretary,
Board of Registration in Medicine.

State House,
Boston, Mass.

* * *

RAYMOND McMURDO v JOHN R. GETTER et al LUMMUS, J

The Plaintiff, a duly registered optometrist, practicing in Spencer, brought this bill "for his own benefit, for the benefit of other optometrists, and for the benefit of the public" to restrain the Defendants, a firm of opticians in Worcester, not physicians or registered optometrists, from practicing optometry in competition with the Plaintiff and other optometrists without being registered under the statute. Neither duly registered optometrist practicing in Worcester was admitted as an intervening party Plaintiff. The case was reported to us on agreed facts without decision.

No question is made of the right of the Plaintiff and the intervenor to relief if the Defendants are practicing optometry illegally.

The Defendants offer for public sale eyeglasses, including frames and lenses desired, to correct defective vision, upon prescription by physicians and optometrists duly registered as practitioners in this Commonwealth. But almost all the prescriptions actually filled are those issued by a physician employed at a weekly salary by the Defendants in their place of business. A customer who desires eyeglasses is taken to the physician who examines the eyes and prescribes eyeglasses if needed. Other employees of the defendants assist the customers in selecting the shape and style of frames desired, grind and fit the lenses in accordance with the prescription of the physician and then adjust the finished eyeglasses to the eyes of the customer.

We conclude that the physician is the servant of the Defendants, notwithstanding the fact that the Defendants actually exercise no control over the mode, manner or result of the examination of the eyes of the customer, and the doctor is left free to exercise his own will and judgment and to use his own professional skill and methods in making such examination. All questions of price and

business policy are determined by the Defendants. The customer pays nothing except a fixed price for the eye glasses which is the same whether he brings in his own prescription or obtains one from the physician employed by the Defendants. That price is retained in whole by the Defendants.

The Defendants contend that they are not practicing optometry illegally, although they are not registered optometrists and yet reap all the financial reward of a practice conducted by their servant who is a physician, and as such, entitled to practice optometry without registration.

The statute (G. L. [Ter. Ed.] c. 112, pp. 66-73, as amended by St. 1934, c. 339, p. 2) defines the practice of optometry as "the employment of any method or means other than the use of drugs for the diagnosis of any optical defect, deficiency or deformity of the human eye, or visual or muscular anomaly of the visual system, or the adaptation or prescribing of lenses, prisms or ocular exercises for the correction, relief or aid of the visual functions." (P. 66.) Before being registered as an optometrist, a person must possess certain educational qualifications and must pass an examination. (P. 66.) Whoever, not being lawfully authorized to practice optometry, practices optometry, or holds himself out as a practitioner or, or as being able to practice, optometry, or violates any other provision of (pp. 66-73, inclusive), or any rule or regulation made under authority thereof, is punishable criminally. (P. 72a.) The restrictions of the statute shall not apply to physicians and surgeons lawfully entitled to practice medicine in the Commonwealth, nor to persons who merely fill prescriptions, or sell eyeglasses as merchandise from permanently located and established places of business without the purpose of correcting defective vision. (P. 73.) Two other exceptions are mentioned later in this opinion. See also St. 1937, c. 287, which takes effect on January 1, 1938.

The Fourteenth Amendment to the Federal Constitution and Articles 1, 10, and 12 of the Declaration of Rights of the Constitution of this Commonwealth, protect every person in the enjoyment of his liberty and property. With in those words is included the right to engage in any lawful occupation, at least any not affected with a public interest. But that right, like many others, may be qualified or restricted under the police power, never precisely delimited, to take rational action for the protection of the public safety, health, morals, comfort and good order. Where the interests of the public might be endangered by the activities of incompetent or unreliable persons, one may be required to show his qualifications before engaging in any particular occupation and to obtain a license attesting his skill and character.

The requirement of license or permit engaging in practice has been held constitutional as to physicians.

Sometimes a statute has purported to require on the part of the proprietor of a business a license attesting skill in acts which he does not perform, but causes to be performed on his behalf by a duly qualified and licensed servant. In *Louis K. Liggett Co. v. Baldridge*, 278 U. S. 105, a statute of Pennsylvania forbade a partnership or corporation to operate a pharmacy unless all the partners or stockholders were licensed pharmacists. It was held that the requirement of ownership by registered pharmacists had no legitimate relation to the health or interests of the public, and that the statute deprived the corporation of its property without due process of law. Such instances are to be distinguished from those in which, for sufficient reason, a license has been required from the proprietor of a business, attesting his fitness to carry it on.

A different rule has been applied to the learned professions. These are characterized by the need of unusual

learning, the existence of confidential relations, the adherence to a standard of ethics higher than that of the market place, and in a profession like that of medicine by intimate and delicate personal ministrations. Traditionally, the learned professions were theology, law and medicine, but some other occupations have climbed, and still others may climb, to the professional plane. Dentistry, a branch of medicine, has done so within modern times. Professional men may be held to a higher ethical code, for example by the restriction of advertising, than men engaged in ordinary business.

The rule is generally recognized that a licensed practitioner of a profession may not lawfully practice his profession among the public as the servant of an unlicensed person or a corporation, and that, if he does so, the unlicensed person or corporation employing him, is guilty of practicing that profession without a license. A corporation as such, cannot possess the personal qualities required of a practitioner of a profession. Its servants, though professionally trained and duly licensed to practice, owe their primary allegiance and obedience to their employer rather than to the clients or patients of their employer. The rule stated recognizes the necessity of immediate and unbroken relation between a professional man and those who engage his services. It was applied recently in this Commonwealth in the case of lawyers. The judicial branch of government to which is entrusted the regulation of practice by attorneys at law, has never relaxed the rule. In the absence of statutory modification in favor of hospitals or others, the same rule applies to physicians and dentists. The position of a physician normally is not that of a servant of anyone.

As to optometrists, there seems to be a conflict of authority. Undoubtedly the fitting and sale of eyeglasses began as a trade and not as a profession. There is some support in decided cases for the proposition that it must remain a trade, in which an unlicensed person or a corporation may engage, provided the actual work is done by a skilled servant duly licensed.

The consideration to the contrary seems to us more weighty. In recent years abnormalities of the eye, like those of the teeth, have been found sometimes, to indicate and often to result in serious impairment of general health. The work of an optometrist approaches, though it may not quite reach, ophthalmology. The learning and the ethical standards required for that work, and the trust and confidence reposed in optometrists by those who employ them, cannot be dismissed as negligible or as not transcending the requirements of an ordinary trade. We cannot pronounce arbitrary or irrational the placing of optometry on a professional basis. This conclusion finds support in other jurisdictions.

Although the statute does not show an uncompromising determination to apply purely professional standards to optometrists, we think that they are in effect placed on a professional plane. A certificate of registration may be revoked for unprofessional conduct. (p. 71), although the statute speaks of an optometric practice in business.

The general principle is recognized that there should be direct professional relations between an optometrist and the members of the public who engage his services. Sec. 72 declares that no optometric practice or business

shall be conducted under any name other than that of the optometrist or optometrists actually conducting such practice or business. That provision, unless this case falls within some exception to it, makes illegal what was done in this case. It prohibits, as a general rule, the practice of optometry by a layman or a corporation through servants, who are registered optometrists. The exceptions tend to show the existence of the general rule for if the

rule were not recognized, the exceptions need not have been expressed. One exception related to the continuance of an optometric practice by the unregistered spouse of a registered practitioner (P 73). Another is that the statute shall not 'prevent the employment by any person of a registered optometrist to be in charge of, or practice optometry in, an optical department conducted by such a person' (P 73). The servant employed in this case did not come within the exception, for he was a physician, not a registered optometrist. It is true that a physician may practice optometry (P 73). But when it comes to the practice of optometry as the servant of a layman or a corporation, the Legislature may rationally have thought that a physician who would accept employment in an optical department would not be likely to acquire a registered optometrist (P 73). We think that upon the agreed facts, that Defendants are practicing optometry without right.

On the agreed facts there must be a decree restraining the Defendants, from practicing optometry, either personally or by any servant or employee, unless and until, and then only to the extent that, they shall become lawfully entitled to do so, with costs against them.

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I talked to about a dozen individuals who attended this meeting, and they seemed to be of the opinion that a blood test was not so important as they had thought, notwithstanding the fact that, after being called upon by Dr Gilbert Smith, I said in part that Dr Nelson did not intend to convey the opinion that blood tests were of no value and should be thrown overboard. They are of value. We have used them successfully and relied upon them since they were first brought out. When a report comes back positive I first check up on the symptoms presented by the patient and have a test made at another laboratory, if the latter is positive, the patient is advised to start immediate treatment.

If Dr Nelson could suggest a blood test that is more efficient than our present ones, his criticism would be quite all right, but as I know he has none, it is of the utmost importance that he curtail his remarks, at least before the lay public.

H M LANDESMAN, MD

366 Commonwealth Avenue,
Boston.

* * *

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

February 7, 1938

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I did discuss blood tests for syphilis at Ford Hall and I did discuss blood tests for syphilis before the joint legislative committee in connection with this department's objection to compulsory blood tests before marriage. Dr Landesman's report of my statements, however, are so at variance with the facts that to review all his errors in reporting would consume too much valuable space. I refer Dr Landesman to my various publications and to those of this department which have to do with the control of syphilis and which have appeared in the *New England Journal of Medicine* and elsewhere at relatively frequent intervals during the past ten years. I refer him particularly to the discussion of blood tests by Garfield and Nelson in the *New England Journal of Medicine* (209 1016-1017, 1933). I will also call his attention to the three or four reports of the United States Public Health Service which have appeared in the *Journal of the American Medical Association*, the *American Journal of Public Health* and *Venerical Disease Information* and which are concerned with evaluations of serologic tests as performed in state and city laboratories.

I do not claim to be a serologist, but I do claim to have a better understanding of the value of blood tests, by themselves, in the diagnosis and control of syphilis, than I am given credit for in Dr Landesman's report of my discussion of them. No one who knows anything about syphilis will deny the value of blood tests. On the other hand, neither will anyone who knows anything about syphilis close his eyes to the limitations of blood tests, alone, in the diagnosis of syphilis.

What seriously concerns me is Dr Landesman's apparent belief that people should be compelled to have blood tests before marriage but should not be informed at all as to the significance of blood tests. One reason among many for our opposition to compulsory blood tests is that a blood test law would tend to support the public in its erroneous belief that a negative blood test rules out infection with syphilis and that a positive blood test indicates communicable syphilis.

The Illinois law is a perfect example of the foolish action which may be taken as the result of misunderstanding of this point. The American public has just recently discovered that syphilis is a prevalent disease and a menace to public health. The people have, furthermore, been put under terrific pressure to do something for the control of syphilis. Unfortunately, action too often finds

expression in compulsory laws. Action of this sort is bound to be ill advised when it is stimulated almost wholly by emotion rather than by any sound knowledge of the problem.

If the American people are to understand syphilis, it is inconceivable that they should be kept in the dark concerning the nature, significance and limitations of blood tests for syphilis. Blood tests are negative throughout the entire incubation period of syphilis. They may be negative for from three to four days to as long as three weeks or more, after the appearance of the primary lesion. They may be negative after a little, but entirely inadequate treatment. They may remain forever positive in those who have had adequate treatment, and they have no significance whatsoever in terms of the communicability of syphilis.

Patients with communicable syphilis may have negative blood tests and should not be permitted to marry. Many patients with positive blood tests have non-communicable syphilis and, under proper conditions, should be permitted to marry. Nothing less than a truthful history, a full and competent physical examination, plus whatever evidence may be had from blood tests performed in a reliable laboratory, will suffice to rule out communicable syphilis.

Blood-test-before marriage laws imply that the public may rest secure on the evidence offered by the blood test alone. Although the Wassermann Laboratory of this department performs a test which stood at the top in the recent evaluation of blood tests (over 90 per cent sensitive and 100 per cent specific), many laboratories fail to detect syphilis in from 40 to 50 per cent of the cases. There are hundreds of laboratories in this country performing blood tests which have never been evaluated by anybody.

I repeat, that if the public is to be compelled to have blood tests performed before marriage, the public should fully understand the nature, significance and limitations of blood tests.

N. A. NELSON, M.D., *Director*
Division of Genitoinfectious Diseases.

Massachusetts Department of Public Health,
State House, Boston.

BUT IT CAN HAPPEN AGAIN!

To the Editor While doing an exploratory of the supraclavicular regions of a grandchild's big doll, born in a New England shop at least seventy five years ago I came upon the lower corners of two pages of some Boston newspaper published about the first of November 1862, which had been used as part of the stuffing of the pseudolady's body. The yellowed and closely printed paper, although not over two square feet in size area including both sides, bore at least eight or nine medicine advertisements.

I read these with interest sufficient to assure me that members of the profession, if not others, in Massachusetts and elsewhere might also read them with average mental satisfaction. The thought that the very large majority of the *Journals*' readers cannot recall the time when state ments as false as those contained in these advertisements were unforbidden by custom or any law confirmed my intention. The few readers who do remember these features of the peaceful and easy horse-and-buggy days perhaps will get out of them enough of amusement and of

psychological gratification to warrant their reproduction in the *Journal*. They certainly contain humor, and there is minor evidence in concrete form of how greatly the art and science of medicine have advanced even in a generation or two. The sixues, if I mistake not, exhibited the extreme development of the characteristically American habits of hustle and of raucous competition, begun long before the Civil War, this type of advertising was ended only by the might of well-enforced law and an awakened common conscience—or shame. Here are some of the advertisements, verbatim.

DR. BIRMINGHAM
NATIVE INDIAN PHYSICIAN
OFFICE, 63 CAMBRIDGE ST. BOSTON
(Corner Chambers street)

MONDAYS TUESDAYS and WEDNESDAYS from 9 A.M. to 2 P.M.
Store open from 8 A.M. to 6 P.M.
A BALM FOR EVERY WOUND

Dr. B. warrants his med. ine to operate as may be necessary and not deplete the system and at the same time to give a healthy tone to the digestive organs, and regulate the nervous system. This medicine has not been compounded from any new discovery but from a knowledge of the Indian method as practiced for many centuries and a practical evidence of physical anatomy which enables the Doctor to prescribe in safety in all cases.

Dr. B. has medicines which he not only prescribes in all chronic diseases but which he warrants will effect a cure when hope has departed. The Doctor's extraordinary natural powers to make an accurate examination of any disease to which human flesh is heir has astonished thousands in this city and elsewhere, and he feels assured that those who entrust themselves to his care will not have cause to regret it. Examinations gratis every day in the week excepting Thursday, Friday and Saturday when he may be found at his residence, on Tanner street, junction of Ayres New City and Lowell E. R. Lowell

DR. WILLIAM CLARK'S
IMPROVED
ANTI SCROFULA PANACEA

Cures Fever and Ague Jaundice Rheumatism Pulmonary Affections, and Scrofula and Humors. The GENUINE manufacture ONLY by
FRANKLIN PUTNAM
No. 4 Newbury place.

DR. TOBIAS VENETIAN LINIMENT

An instantaneous remedy for chronic rheumatism headache, toothache, croup, colic, quinsy, sore throat and pains in any part of the body. Try a bottle and be convinced. Remember this article is a success, not an experiment—for 14 years it has been tested. Every one who uses it recommends it. No medicine ever had such a reputation as this liniment. It has worked its way before the public and all are loud in its praise. Chronic rheumatism. Thousands who laid for weeks on a bed of agony and never walked without the aid of crutches with this complaint can testify to the magical effects of this liniment. They are cured, and proclaim its virtues throughout the land. Remember relief is certain and a positive cure is sure to follow. Headache of all kinds we warrant to cure. Purged sore throat, quinsy and diphtheria are robbed of their terrors by a timely use of the Venetian Liniment. It has saved hundreds the past three months.

Price 25 and 50 cents a bottle. Depot No. 56 Cortlandt street New York. Sold by all Druggists. Wholesale by GEO. C. GOODWIN & CO. 11 & 12 Marshall street Boston.

FACTS FOR SOLDIERS

Throughout the Indian and Crimean Campaigns the only medicines which proved themselves able to cure the worst cases of Dysentery, Scoury and Fever were HOLLOWAY'S PILLS and OINTMENT. Therefore, let every Volunteer see that he is supplied with them. Only 25 cents per pot or box.

VICTIMS OF CATARRH

Will please bear in mind that Dr. Wadsworth's celebrated DR. UP will cure them of that complaint after all the extravagantly vaunted nostrums have failed though the case be never so bad. For sale by M. S. BLISS & CO. and G. C. GOODWIN & CO.

Also by the Proprietor H. H. BURLINGTON Providence R. I.

IT FALLS ALIKE TO THE JUST AS WELL AS THE UNJUST—The scourge of Monthly Sufferings, so common to Females, remains as mysterious in the works of the Creator. No direct relief has been found for it until the application of *Hunnewell's Cold Anodyne* which has given astonishing relief in all cases, while Nature's end is not disturbed. To those who dread the periods of so much suffering the nervous system sympathizes, a wreck follows, and all the weakness and debility so common to women date from it. For all nervous and spasmodic complaints the anodyne is truly invaluable and should be in every family.

Also in cases of *Throat and Ling Complaints* let HUNNEWELL'S UNIVERSAL COUGH REMEDY have the confidence of all and to test the

rule were not recognized, the exceptions need not have been expressed. One exception related to the continuance of an optometric practice by the unregistered spouse of a registered practitioner (P 73). Another is that the statute shall not "prevent the employment by any person of a registered optometrist to be in charge of, or practice optometry in, an optical department conducted by such a person (P 73). The servant employed in this case did not come within the exception, for he was a physician, not a registered optometrist. It is true that a physician may practice optometry (P 73). But when it comes to the practice of optometry as the servant of a layman or a corporation, the Legislature may rationally have thought that a physician who would accept employment in an optical department would not be likely to acquire a registered optometrist. (P 73) We think that upon the agreed facts, that Defendants are practicing optometry without right.

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NOTICES

Vol. 218 No. 9

pause It is an involutonal change, and although the disease may start with a solitary cyst, other cysts may develop in the same or contralateral breast. The cyst has a smooth, spherical outline and transmits light. The content of the cyst, which is frequently called 'blue-domed' is a light milky fluid. If the diagnosis is uncertain, exploration should be done. Otherwise the cysts should be aspirated and endocrine therapy carried out.

There were 610 cases of fibroadenoma—a benign tumor. The average age at which women present themselves with this lesion is 25 years. The average duration of symptoms is from 3 to 5 years. Examination reveals a well-developed breast. The tumor is solitary, dense and has a lobulated surface. There is no dimpling of skin or atrophy of overlying fat. Histologically the tumor represents an overgrowth of connective tissue with hypertrophy of the ducts. The tumor may double its size during pregnancy. Rarely the tumor may become malignant, particularly at the menopause. It should be removed surgically at the time of diagnosis.

There were 182 cases of benign intracystic papilloma in the series. This is a tumor arising from embryonic rests, it is found near the nipple and becomes manifest at the menopause. The outstanding symptom is bloody discharge from the nipple. At times this tumor may be transformed into a carcinoma. Should this occur, the degree of malignancy is low grade. Operative intervention for benign intracystic papilloma should be postponed till the tumor becomes palpable, in the interim the patient is watched very closely.

In the carcinoma group there were 2700 cases, of which 2100 have been classified. These are divided into three groups. The first group consists of half the cases. This is the scirrhous carcinoma, or carcinoma simplex. Most of the cases appear between 40 and 50 years of age. The characteristic features are it is solitary, it appears very near the examining finger because of the atrophy of the overlying fat, its consistence is hard, its shape irregular, and it is fixed to neighboring structures, as the skin. Fifty per cent of the cases in this group had axillary lymph node metastases at the time of treatment. The average duration of symptoms was from 6 to 12 months. There were 5-year survivals in 29 per cent of the cases. As a group, it is a situation which needs considerable improvement.

One quarter of the carcinoma group was made up of papillary carcinomas. This is the most favorable type of cancer, and has 60 per cent 5-year survivals. In the remaining quarter the prognosis is very poor, these cases chiefly consist of local recurrences following operation and of huge tumors involving the whole breast.

Dr Reuben Davidoff opened the discussion, stressing the need for therapeutic improvement. He suggested radiation as a possible answer to the problem. Dr Harry Friedman presented photomicrographs revealing the effect of x-ray irradiation on 2 cases of carcinoma of the breast. An increase in fibrous tissue was a prominent feature. Dr Max Ritvo presented slides of soft tissue roentgenograms revealing the outlines of breast tumors. He suggested castration in cases of carcinoma as a preventive of pregnancy in order to prevent increased growth imparted to the tumor by this state. He also advised x-ray irradiation to the supraclavicular area and axilla after radical operation. Dr Carl Bearse stressed the importance of early treatment of mammary carcinoma.

In closing the discussion, Dr Geschickter stated that in the last two decades the 5-year survivals at the Johns Hopkins Hospital have increased 5 per cent.

NOTICES

REMOVAL

S J ALLMAN, M.D, announces the removal of his office to 611 River Street, Mattapan

UNITED STATES CIVIL SERVICE EXAMINATIONS

Medical Pathologist (Research), \$3,800 a Year
Associate Medical Pathologist (Research), \$3,200 a Year

Applications must be on file with the United States Civil Service Commission at Washington, D C., not later than March 21

Applicants must have been graduated from a medical school of recognized (class A) standing with the degree of M.D and must have served one year of internship, or they must have been graduated from a medical school of recognized standing which requires the completion of one year internship (5 year schools) before granting the degree of M.D

Applicants for the position of medical pathologist (research) must have been graduated subsequent to December 31, 1916, and applicants for the position of associate medical pathologist (research) must have been graduated subsequent to December 31, 1929

Applicants for the position of medical pathologist (research) must have had at least three years, and applicants for the position of associate medical pathologist (research) must have had at least 18 months, of postgraduate study in pathologic anatomy and histology in an institution or department offering regular postgraduate courses in pathology, or postgraduate experience in pathologic anatomy and histology, or a combination of the postgraduate study and experience. At least one year of the postgraduate study or experience must have been obtained within the five years immediately preceding the date of the close of receipt of applications

BOSTON CITY HOSPITAL

The monthly conference of clinical pathology will be held at the Boston City Hospital on Wednesday, March 9, at 12 o'clock noon, in the pathological amphitheater

JOSEPH E. HALLISEY, M.D. *Secretary,*
Medical Staff

JOINT MEETING OF THE SUFFOLK DISTRICT MEDICAL SOCIETY AND THE OBSTETRICAL SOCIETY OF BOSTON

There will be a joint meeting of the Suffolk District Medical Society and the Obstetrical Society of Boston on Tuesday, March 15, at 8 15 p m., at the Boston Medical Library, 8 Fenway

Dr James M Faulkner will speak on Heart Disease in Pregnancy which will be discussed by Drs Frederick C. Irving, Burton E. Hamilton, Benjamin Tenney, Jr., and W Richard Ohler

JOHN P MONKS, M.D, *Secretary*
Suffolk District Medical Society

GEORGE V S SMITH, M.D, *Secretary*
Obstetrical Society of Boston

real theory that such are only curable by the simple form by which this is prepared

Also Dyspepsia Biliousness Indigestion &c &c are perfectly cured by Hunnewell's Eclectic Pills which are a perfect type of the true Cathartic

JOHN L. HUNNEWELL Proprietor Boston Mass

For sale by all Wholesale and Retail Dealers in city and country

NERVOUS DEBILITY and all Sexual Diseases a new and positive CURE, the genuineness of which is vouched for by the best papers in the country No fees EVER required Send stamps to box 1647 Boston Mass

Points of relative interest should be noted warranted to operate as may be necessary", 'delitate', 'not been compounded from any new discovery', "the Indian method" (how long a way from science!), 'a practical evidence of physical anatomy', 'accurate examination * * * gratus', 'panacea', 'scrofula', 'humors', 'croup', 'no medicine ever had such a reputation as this', 'magical effects of this liniment', 'remember relief is certain', 'a positive cure is sure to follow', "diphtheria is robbed of its terrors by a timely use of Venetian Liniment", the false appeal to Civil War volunteers to buy Holloway's pills and ointment (how the wives and mothers insisted on this!), "celebrated Dry Up", scourge of monthly suffering remains as mysterious in the works of the Creator", 'Eclectic Pills, perfect type of the true cathartic.' To not a very few only of the readers, especially residents of Boston, some of the 'doctors' names and addresses may have additional interest—it is only a little way back to 1862

Medical 'truth is marching on!' But, Is man less gullible?

G V N DEARBORN, M.D

387 Wyoming Avenue,
Maplewood, New Jersey

REPORTS OF MEETINGS

BOSTON TUBERCULOSIS ASSOCIATION

At the annual meeting of the Boston Tuberculosis Association, February 15, the following officers, executive committee and council of the Association were elected for the year—president, John B Hawes, 2nd, M.D., vice president, Reginald Fitz, M.D., treasurer, George S Mumford, clerk, Alexander Wheeler executive committee, Lloyd T Brown, M.D., Richard Ebrlich, Reginald Fitz, M.D., Cleveland Floyd, M.D., Miss Sarah A Hyams, Mrs Elliott P Joslin, Honorable John V Mahoney, Henry C McKenna, Everett Morss, Jr, George S Mumford, Miss Julia C Prendergast, Miss Lilian V Robinson, Alexander Wheeler and Nathaniel K. Wood, M.D., council, Mrs Carlton Allard, Mrs William H Ames, Theodore L. Badger, M.D., Reverend Robert P Barry, Henry D Chadwick, M.D., Edward D Churchill, M.D., Mrs Norman R. Doyle, Adolph Ehrlich, Mrs. Gardiner H. Fiske, Justin F Grant, M.D., Reverend Dana Greeley, John B Hall, M.D., Mrs John D Henry, Mrs Paul Hubbard, Governor Charles F Hurley, James A. Keenan, M.D., Fred M Kennison, M.D., Donald S King, M.D., Reverend Arthur L Kinsolving, Mrs Edward Leete, Miss Elizabeth Carter Leland, Rabbi Harry Levi, Harry Linenthal, M.D., Frederick T Lord, M.D., Honorable Frederick W Mansfield, T E A McCurdy, M.D., Leroy Miner, M.D., D.M.D., George R. Minot, M.D., Horace Morison, George S Mumford, Jr, Harlan F Newton, M.D., Miss Caroline E Nutter, William Cardinal O'Connell, George T O'Donnell, M.D., Mrs Robert W Oliver, Richard H. Overholt, M.D., Mrs George W Perkins, Alton S Pope, M.D., Reverend Richard J Quinlan, Abraham C Ratsbesky, William H. Robey, M.D., Mrs E. Pakenham Ruggles, Samuel R. Ruggles, Henry L. Shattuck, Edmund

H. Talbot, Honorable Maurice J Tobin, Mrs Thomas F Tully, Professor Clair E Turner, H. F R. Watts, M.D., and Raymond S Wilkins

BROOKFIELD MEDICAL CLUB

The Brookfield Medical Club held its 557th meeting at Ye Olde Tavern, West Brookfield, on February 16, with Dr Joseph Slowick, of Palmer, as host. Dr James Kilburn, of Springfield, delivered the address of the afternoon on the subject of 'Malignant Tumors of the Kidney' At this meeting a larger number of members attended than at any other regular meeting in the history of the club, 28 out of 36 members being present. Dr Raoul J LeBeau, of Spencer, was elected to membership at this meeting

The March meeting will be held at the Phoenix Restaurant, Ware, on March 16, with Dr Tracy L. Roberson, host, and Dr George L. Schadt, of Springfield, as speaker, the latter's subject will be Modern Laboratory Technique for the Practicing Physician

J R. FOWLER, M.D., Secretary

GREATER BOSTON MEDICAL SOCIETY

The Greater Boston Medical Society met February 1 in the auditorium of the Beth Israel Hospital, Boston. The chairman was Dr Kermit C Rosen, and the speaker Dr Charles Geschickter, of Baltimore. His subject was 'Diagnosis and Treatment of Neoplasms of the Breast.' The material presented came from the cases of the Johns Hopkins Hospital

In the benign group there were 2021 cases. Of these 75 were cases of benign hypertrophy. This lesion is fundamentally an overgrowth of fibrous tissue—peculiarly abundant in the human breast. The commonest period of manifestation of this condition is at puberty, although occasional cases appear after the first child is born. The condition is not precancerous. Its greatest harm is the mental effect on the patient. Since plastic operations are usually unsatisfactory, the operation, if performed, should be mastectomy. Estrin therapy is unsatisfactory and usually aggravates the condition.

Chronic cystic mastitis yielded 1129 cases, which were divided into three groups: mazoplasia (painful breast), 387 cases, adenosis, 172 cases, and cystic disease, 570 cases. In all its forms it is an endocrine disturbance.

Mazoplasia appears early in life, the usual age being 30 years. The patients are single or married, but sterile. The menstrual cycles are normal. The breasts may be painful throughout the cycle. Examination reveals a firm upper outer quadrant to the breast. The breast becomes reduced in size after the menstrual period. Good therapeutic results are obtained with estrin and with assurance.

Adenosis, or Schummelbusch's disease, is found most commonly in women between 38 and 42 years of age. They are of the nervous type, the thyroid is frequently palpable, and the menstrual cycle is short, lasting from 24 to 26 days. The lesions are frequently bilateral. There is a nodular or shotty feel in the upper outer quadrant and about the periphery of the breast. There may be cysts, which as a rule are small. Microscopically there is an overgrowth of fibrous tissue and glands. The latter situation is at times mistaken for cancer. Evidence does not indicate that chronic cystic mastitis is a precancerous lesion.

Cystic disease is the third form of chronic cystic mastitis. It appears most commonly at the time of the men-

PLYMOUTH

Meetings will be held at 11 a. m. on March 17 April 21 May 19 and July 21

SUFFOLK

March 15—Joint meeting with Boston Obstetrical Society Page 40*

WORCESTER

At the following meetings except the annual meeting dinner will be at 6.15 to be followed by business session and scientific program

March 9—Memorial Hospital Worcester

April 13—Hahnemann Hospital Worcester

May 11—Afternoon and evening annual meeting Place and schedule of program to be announced.

BOOK REVIEWS

Chemistry of the Brain Irvine H. Page. 444 pp. Springfield and Baltimore Charles C Thomas, 1937 \$7.50

The study of the chemistry of the brain is of fairly recent origin and, as Dr Page points out in his introductory chapter, the founder of this branch of medicine, J. L. W. Thudichum, did his work in the last half of the nineteenth century. A man of wide culture, living in London, Thudichum's report for the Privy Council has only recently been re-read and evaluated. He was able to determine the structure of many substances in the brain and his classical work, *Chemical Constitution of the Brain* (1884), was the only monograph on the subject, up to his time, of any importance.

Dr Page has carried on this work, so ably begun by Thudichum and more recently promulgated by the chemical division of the Kaiser Wilhelm Institute in Munich, at the Rockefeller Institute for Medical Research in New York City. The author of this monograph not only includes what is ordinarily considered the chemistry of the brain substance, but has extended his study to the chemistry of the blood as it enters and leaves the skull, of the cerebrospinal fluid, of brain dysfunction and also of tissue culture. The book brings together a widely scattered literature in a form which is easy to refer to, for the text is particularly well set up and the immediate references are found as footnotes. Although the book cannot be completely analyzed in this review, a list of the chapters will indicate its scope: 'Sterols, Phosphatides, Fatty Acid Metabolism,' 'Nitrogenous Metabolism, Electrolytes and Gases,' 'Enzymes of the Brain,' 'Diet, Vitamins and Degeneration of the Nervous System.' Each of these sections and others are carefully reviewed. The book closes with an interesting philosophic chapter on 'The Brain and Thought.' This monograph supplants all previous works in this highly technical field. Its publication forms an epoch in brain chemistry.

In addition to the contents of this book, one notes with pleasure the easy reading page, the excellent charts and diagrams, the lightweight paper, and other features of bookmaking, which serve to classify this volume at the very top of recent scientific publications.

Twenty-Five Years of Health Progress A study of the mortality experience among the industrial policy-holders of the Metropolitan Life Insurance Company 1911 to 1935 Louis I. Dublin and Alfred J. Lotka. 611 pp. New York Metropolitan Life Insurance Company, 1937

Most valuable source material has been made available by the Metropolitan Life Insurance Company in this volume. The authors state in the preface: 'The body of facts given here may serve as a guide to the formulation of a working program, the data will reveal the best points of attack and make possible the concentration of effort where

it will yield the most good. Throughout the volume are indications of what yet remains to be accomplished in the prevention of sickness and premature death. To this end investigators interested in extending the boundaries of medical knowledge will find in the pages which follow many suggestions for further research.'

The book should be of great value to individuals studying the trends of disease. In doing this, however, one should bear in mind that the group studied is not a cross-section of the American populace. It differs considerably in economic status, in age and sex distribution, in color and in occupation. To the individual who keeps these facts in mind, this book offers most excellent source material, and the reputation of its authors is such that it may be used with no reservations aside from those mentioned above.

This volume covers general mortality from all causes, trend of longevity through a quarter of a century, the principal communicable diseases of childhood, tuberculosis, influenza and pneumonia, cancer, principal cardiovascular renal diseases, diabetes mellitus, diseases of the puerperal state, typhoid fever, acute poliomyelitis, syphilis, acute rheumatic fever, exophthalmic goiter, pernicious anemia, ulcer of the stomach and duodenum, diarrhea and enteritis, appendicitis, hernia, intestinal obstruction, cirrhosis of the liver, biliary calculi, suicide, homicide and various forms of accidents.

The volume is addressed to physicians, health officers, sociologists, life insurance officials and others interested in the health and welfare of the wage-earning population.

The general usefulness of this book will naturally be limited to students and authors of medical statistics, particularly those statistics dealing with trends of disease.

The chapter on methods of compilation and analysis should be of great help to writers, the tables and graphs which are scattered throughout the text, as well as in the sixty-four page appendix, should be advantageous. Many of the tables are based on rates standardized for age. This removes the pitfall of crude rates. For example, cancer among white females when standardized showed no increase throughout the entire period although the crude rates for the same period showed a considerable rise.

The book should admirably serve the purpose for which it was written.

The Human Mind Karl A. Menninger. Second edition. 504 pp. New York Alfred A. Knopf, 1937 \$5.00

When the first edition of this work appeared, it represented a happy compromise between those books dealing with psychologic phenomena which tacitly suggest to the lay reader that he is being allowed in on the ground floor to see revealed the secrets of the physician and psychiatrist and those other books discussing the basic phenomena of psychiatry which are in themselves scholarly but none the less puzzling even to psychiatrists long past the tyro stage. In this volume, the author has with Aristotelian logic, presented the field of personality and described the form, etiology and treatment of the major psychiatric conditions. Illustration is for the most part case material from Dr Menninger's extensive and varied experience in mental disease which began with his training at the Harvard Medical School and the Boston Psychopathic Hospital under the late Dr E. E. Southard and has continued until the present time. (He is now co-director of the Kansas sanatorium bearing his surname.) An acknowledgment is made in the reprinted preface to the author's teachers: this includes such outstanding names as Southard, Meyer, Jelliffe, White, Healy and Williams.

THE GUILD OF ST LUKE

The regular meeting of the Guild of St. Luke will be held at the Boston Medical Library, 8 Fenway, on Monday evening, March 7, at 8 15

Dr Morris Fishbein, editor of the *Journal of the American Medical Association*, will speak on 'Medicine and the National Policy' Collation will follow

D L LYNCH, M.D., *Secretary*

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, March 15, at 12 o'clock noon

Dr Chester M Jones of the Massachusetts General Hospital will speak on 'Diagnostic Aspects of Pain Referred from the Digestive Tract.'

All physicians are cordially invited to attend.

JOHN B HALL, M.D., *Secretary*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, March 8, at 8 15 p m

PROGRAM

Presentation of Cases

Exchanges between Cells and Interstitial Fluid Dr John P Peters, New Haven, Connecticut.

Medical students and physicians are cordially invited to attend

MARSHALL N FULTON, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MARCH 7

MONDAY MARCH 7

4 p m Physicians and medical students are cordially invited to attend a clinic presented by the medical surgical and orthopedic services of the Infants and Children's hospitals in the amphitheater of the Children's Hospital

12 m Boston University Medical Society Evans Memorial auditorium
78 East Concord Street Boston

8 15 p m The Guild of St Luke Boston Medical Library

TUESDAY MARCH 8

9 10 a m Boston Dispensary Phlebitis Dr Edward A Edwards

*10 a m 12 30 p m Tumor clinic Boston Dispensary

*8 15 p m Harvard Medical Society Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance)

WEDNESDAY MARCH 9

*9 10 a m Boston Dispensary Hospital case presentation Dr S J Thannhauser

12 m Clinicopathological conference Children's Hospital Amphitheater

12 m Boston City Hospital Conference on clinical pathology Pathological amphitheater

THURSDAY MARCH 10

New England Hospital Association Hotel Statler Boston

8 30-9 30 a m Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Peter Bent Brigham Hospital

9 10 a m Boston Dispensary Social Service Case Presentation Mrs H B Hooker and Miss E Grundy

FRIDAY MARCH 11

New England Hospital Association Hotel Statler Boston

9 10 a m Boston Dispensary Some of the Newer Aspects of Collapse Treatment of Pulmonary Tuberculosis Dr Richard H Overholt

10 a m 12 30 p m Tumor clinic Boston Dispensary

SATURDAY MARCH 12

New England Hospital Association Hotel Statler Boston.

*9 10 a m Boston Dispensary Hospital case presentation Dr S J Thannhauser

10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital. Conducted by Dr Henry A Christian

SUNDAY MARCH 13

4 p m Illustrated public health lecture, Faulkner Hospital auditorium Diets and Vitamins in the Preservation of Health. Dr Maurice B Strauss

4 p m Free public lecture Harvard Medical School amphitheater of Building D Nervous Fatigue. Dr Merrill Moore.

Open to the medical profession

MARCH 3 — George Washington Gay Lecture Tufts College Medical School 4 p m

MARCH 3 — Faulkner Hospital Clinicopathological conference, 5 p m.

MARCH 7 — The Guild of St. Luke Notice above.

MARCH 7 — Boston University Medical Society Page 368 issue of February 24

MARCH 8 — Harvard Medical Society Notice above.

MARCH 9 — Boston City Hospital Conference on Clinical Pathology Page 407

MARCH 10 — Pentucket Association of Physicians. Hotel Bartlett 95 Main Street Haverhill 8 30 p m

MARCH 10 11 12 — New England Hospital Association Page 51 issue of January 6

MARCH 15 — South End Medical Club Notice above.

MARCH 16 — Brookfield Medical Club Page 406

MARCH 21 — Boston Medical History Club 8 15 p m Boston Medical Library

MARCH 28 APRIL 1 — Postgraduate Institute of the Philadelphia County Medical Society Page 284, issue of February 10

APRIL 5 — Greater Boston Medical Society 8 30 p m auditorium of Beth Israel Hospital Boston

APRIL 4 8 — The American College of Physicians Page 41 issue of July 1

APRIL 26 — New England Society of Psychiatry Page 322 issue of February 17

MAY 31 JUNE 1 and 2 — Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

JUNE 13 17 — American Medical Association. San Francisco

JUNE 13 OCTOBER 8 and NOVEMBER 15 — American Board of Ophthalmology Page 282 issue of February 10

OCTOBER 17 21 — Clinical Congress of the American College of Surgeons, New York City

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5 — 5 p m New Bedford

ESSEX SOUTH

APRIL 6 — Gloucester Hospital Gloucester Clinic at 5 p m Dinner at 7 p m Speaker and subject to be announced

MAY 5 — Censors meet at Salem Hospital 3 30 p m

MAY 11 — Annual meeting Salem Country Club Peabody Dinner at 7 p m Speaker and subject to be announced.

FRANKLIN

Meetings will be held at the Franklin County Hospital Greenfield at 11 a m the second Tuesdays of March and May

HAMPTDEN

Meetings will be held on the fourth Tuesday in April and July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club Stoneham at 12 15 p m on March 16 and May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27

NORFOLK DISTRICT

MARCH 29 — Hotel Kenmore 8 15 p m Subject to be announced but to be related to diseases of the kidney Dr Albert A Horner

MAY — Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon

MARCH 3 — Norfolk County Hospital South Braintree

APRIL 7 — At the Quincy City Hospital.

MAY 5 — Annual meeting

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THE MASSACHUSETTS PNEUMONIA PROGRAM

HENRY D CHADWICK, M.D *

BOSTON

THE Massachusetts records of vital statistics for the past eighty years show that pneumonia has been one of the six leading causes of death in every age group from infancy to old age for that entire period. The rate for each decade beginning with 1856-1865 rose from 107.4 per 100,000 to a maximum of 180.7 in 1886-1895, and has since declined to its present level of 96.1. This is but 11 points, or 10.3 per cent, lower than it was eighty years ago, but compared with the highest rate, which was recorded forty years ago, the decline has been 84.4 points, or 51.7 per cent.

at least do something about it. With the aid of Dr. Benjamin White, director of the Antitoxin and Vaccine Laboratory, he developed a plan that was put into effect in January, 1931, and has been carried out since then with but few modifications.

The Massachusetts pneumonia study had two objectives: the evaluation of pneumonia serum under the conditions of the general practice of medicine, and the development of plans for the distribution of this serum for the treatment of those patients who might reasonably be expected to benefit from its use. It thus embraced prob-

Table 1 *Average Annual Death Rates per 100,000 Population of Certain Communicable Diseases in Massachusetts*

YEARS	PNEUMONIA (ALL FORMS)	TUBERCULOSIS (ALL FORMS)	WHOOPING COUGH	MEASLES	SCARLET FEVER	DIPHTHERIA	TYPHOID FEVER	SMALLPOX
1856-1865	107.4	446.4	23.8	17.1	101.3	86.1	92.5	11.0
1866-1875	132.2	401.2	20.7	15.1	76.6	58.4	80.8	17.3
1876-1885	150.1	378.3	15.1	9.6	33.8	127.2	47.4	1.3
1886-1895	180.7	326.8	12.8	8.7	20.6	73.7	36.9	0.3
1896-1905	174.7	242.9	10.3	7.3	9.9	38.4	21.0	1.6
1906-1915	174.1	170.5	8.2	6.4	6.9	19.4	10.6	0.1
1916-1925	164.8	113.7	9.3	7.8	3.7	15.2	2.9	0.06
1926-1935	99.1	62.8	3.7	3.0	2.4	3.8	0.8	0.002
1936	96.3	43.1	1.2	0.8	1.0	0.6	0.2	0.000
Percentage decline 1856-1936	10.3	90.3	94.9	95.3	99.0	99.3	99.8	100.0

All the other communicable diseases with which the Massachusetts Department of Public Health has been chiefly concerned, declined from 90 to 100 per cent in the same period of time. Tuberculosis, which had formerly had a rate four times as high as that of pneumonia, declined to less than one half of it. Both these diseases claimed a large percentage of their victims when they were in the prime of life and of the greatest economic value to the community. Public-health authorities made great efforts to control and eradicate tuberculosis, but kept only a tally sheet of the deaths from pneumonia. One of the greatest public-health problems was being neglected. Dr. George H. Bigelow, when commissioner of public health, had the foresight and vision to attempt to solve it or

lems of scientific research as well as of administrative procedure.

The purposes of the plan may be summarized as follows:

- 1 To study the epidemiology of lobar pneumonia in the State.
- 2 To promote more prompt diagnosis of the disease.
- 3 To encourage and facilitate earlier and more general serum treatment.
- 4 To study and improve methods for serum production.
- 5 To correlate the studies on serum production with the results following its clinical use.
- 6 To devise procedures for the future prevention, serum treatment and control of the disease.

The development of such a program, looking forward to the eventual state-wide distribution of

Read before a meeting of the American Clinical and Climatological Association, Baltimore, Maryland, October 11, 1937.
Massachusetts Commissioner of Public Health

The purpose of this revision is to evaluate anew the present-day knowledge of the human mind in light of the seven years' advances since the book was first published and of the writer's increasing experience and acquaintance with psychologic phenomena. The attitude of physicians is being directed more and more toward the psychosomatic problem, and due stress is laid upon this point of view. New methods of treating psychoses and neuroses have made necessary the enlargement of the chapter on therapy.

The section dealing with psychoanalysis has been handled with a great deal of delicacy but without undue concession to the antipodal points of view which surround this technique. It is also much more specific than was the same section in the earlier edition, due in large measure to the systematized form of this edition and the arrangement of material.

Dr Menninger's unwillingness to accept the doctrine of "hereditary damnation" has led him to expand on the fruitful possibilities of education by the application of psychologic methods in pastoral work. The importance of trained psychiatric nursing is observed, and it is indicated why an indifferent and untrained nursing personnel has in the past retarded and prevented improvement in many cases of mental disease.

Although this cannot be recommended as a textbook in pure psychiatry for medical students or interns, it can be used as supplementary material by them. It will find its best application as a book to be placed in the hands of physicians in other specialties who find that psychiatric problems interject themselves into a disease syndrome with persistent regularity. Nurses and social workers will waste no time if they make a careful study of its pages. To a certain extent it can be recommended to the relatives of patients who, never having been required to face the problem of mental disease, are resistant to the suggestions of the psychiatrist because they do not know what he is talking about. When the facts are explained as Menninger has done with an economy of space, relatives often become increasingly co-operative to what has previously seemed a bizarre plan of treatment. The author is to be congratulated upon the accuracy, format and diction of this book.

Methods of Treatment Logan Clendening Sixth edition
879 pp St. Louis The C V Mosby Company, 1937
\$10.00

The popularity of this book as demonstrated by the fact that this is the sixth edition cannot be dismissed in figuring its value. To the reviewer the impression is created that an attempt has been made to cover more ground than is possible in such a volume. A great number of procedures are mentioned without making it clear which of the various procedures are universally or in the author's opinion considered more worth while. Some of the methods mentioned in the line of treatment are considered by the reviewer to be of very little value. Therefore, although the student or physician will probably find in this volume a statement in regard to almost any type of therapeutic procedure, he will find some which are not of recognized therapeutic value at the present time and will not receive guidance in regard to which are of more value. In the treatment of congestive heart failure for instance there is no clear-cut or concise statement in regard to just what to do in order to clear up the edema, although there is a considerable amount of space used in a rambling discussion of the pathologic physiology of heart failure. The reviewer is surprised that a book of this type has obtained the popularity to make it worth while for the publishers to put out six editions.

Les Hepatites Maurice Loeper 262 pp Paris Masson et Cie, 1937 60 Fr fr

This little monograph is a summary of our present knowledge of hepatitis due to various causes. The author, besides discussing the causes of abdominal meteorism, ventures the theory that it is due to insufficient circulation to the liver. It must be confessed that his arguments seem quite weak. There is an interesting chapter on catarrhal jaundice and a good chapter on spirochetal jaundice. The discussion of hemachromatosis appears inadequate as there is no reference to the theory of copper poisoning as an etiologic factor. The final chapter, devoted to tuberculous peritonitis as a complication of chronic hepatitis, could have been omitted without damage to the volume. There are numerous illustrations, and the photographs and photomicrographs in the first part of the book are printed upon heavy glazed paper of excellent quality. In the latter part, however, a dull paper is used, which gives the reproductions a muddy appearance. Although this is not a complete treatise, the author has given a fairly good survey of the subject, but more than this, one must commend him for inserting a few references—an unusual and praiseworthy action by a French author.

A Textbook of the Practice of Medicine Oxford Medical Publications Edited by Frederick W Price. Fifth edition. 2038 pp New York Oxford University Press, 1937 \$12.50

This textbook contains 2000 pages of rather finely printed information concerning all phases of the practice of medicine, edited by Frederick W Price and contributed to by a score or more of his colleagues. It represents the best thought in British medicine. Each section is signed by its author or authors and most of the material in this, the fifth, edition has been brought up to date.

Protamine insulin is mentioned as is "sulphon amide," and in most subjects the material is as up-to-date as one could reasonably expect in a work of this scope. Considerable space now devoted to polygraphic tracings of the heart and their significance might well be eliminated in favor of a discussion of the Lead 4 in the chapter on clinical electrocardiography. It was only in these chapters that the reviewer felt that this fifth edition might be lagging behind the times.

It is an extremely useful book for medical students and the editor's hope that it "may be considered a credit to the London School of Medicine" is abundantly fulfilled.

Muir's Bacteriological Atlas C E. van Rooyen. 90 pp. Second edition. Baltimore William Wood & Co., 1937 \$5.25

The first edition of this small book was published by the late Richard Muir in 1927, and consisted of some fifty-odd, excellent, colored plates, with explanatory legends, which were reproductions of charts drawn by Dr Muir and used by him for teaching bacteriology in the University of Edinburgh.

The present edition has been enlarged and the text rewritten by Dr C. E. van Rooyen. Twenty six new colored plates have been added, and the illustrated micro-organisms include not only bacteria but also fungi, viruses, rickettsias and animal parasites. The accompanying legends are short but adequate. The atlas should prove to be extremely valuable to those beginning the study of medical bacteriology. As suggested by the author of this revised edition, it should be used only in conjunction with a standard textbook.

able on an equal basis to all physicians in the State.

Early in the study the State was divided into areas, and two or more locally prominent physicians were selected as collaborators in each area. These men were given a few weeks' time to become familiar with recent literature on pneumonia and were then requested to attend a graduate course on pneumonia arranged through the Harvard Medical School. Laboratory technicians in one or more centrally located hospitals of each area were given a week's training in the State bacteriological laboratory in pneumococcus typing. Concentrated bivalent Type I and Type II anti-pneumococcic serum was supplied only to the collaborators in the special districts, for use in cases of lobar pneumonia which they might see in consultation or in their own practice.

By 1934 a review of the experience of the State bacteriological laboratory with the then new Neufeld method of typing showed it to be simple, rapid and reliable. The time required for typing was reduced in most instances from many hours to a few minutes. During the study, typing was carried out on nearly ten thousand specimens obtained from patients with lobar pneumonia or bronchopneumonia, and in a few instances from those with other varieties of respiratory disease. If all specimens had come from patients with lobar pneumonia, undoubtedly a larger percentage of Type I and Type II pneumococci would have been found. The six commonest types of pneumococci found in this large group were Types I, III, VIII, II, V and VII, in the order named. These were found in 41 per cent of all specimens examined, or 67 per cent of all specimens containing pneumococci which could be typed.

Table 2. Six Commonest Types of Pneumococci Found in the Examination of 9737 Specimens from Patients with Respiratory Disease

TYPE	NO. OF CASES
I	1485
III	1022
VIII	495
II	373
V	284
VII	233
Total	3903

The fatality rates for cases treated with specific serum in the early part of the Massachusetts study and the results reported elsewhere in this country clearly showed that the maximum benefit of serum treatment was obtained when such treatment was begun within the first four days of illness, and further that the serum then available was useful for treating only Type I and Type II cases. As a consequence, it was decided to broaden the scope of the plan and inform all physicians that under

certain conditions they could obtain serum from the laboratory of one of their near-by hospitals where there was a technician who had qualified in pneumococcus typing at the State laboratory. These conditions were

- 1 Sputum or other material from the patient shall first be typed and shown to contain Type I or Type II pneumococci
- 2 The physician must be willing to certify that his patient has not been ill with pneumonia longer than four days (ninety six hours)
- 3 The physician must agree to fill out and return to this department, when his patient is discharged, a brief questionnaire which will be furnished to him with the serum

Upon meeting these requirements, physicians would receive an average dose of serum, or 60,000 units for Type I cases and 100,000 units for Type II cases.

Table 3. Fatality Rates of Cases of Pneumococcus Pneumonia Treated with Concentrated Serum within 96 Hours of Onset, and Those Not Given Serum

	NO. OF CASES	DEATHS	FATALITY RATE %
TYPE I			
Treated with serum*	1043	145	13.9
Treated without serum†	1514	403	25.0
TYPE II			
Treated with serum*	231	63	22.4
Treated without serum†	992	407	41.0

*Massachusetts Pneumonia Study cases from January 1931 to June 30 1937

†Cases collected from the American and Canadian literature 1912 to 1933

Provision also was made to distribute an additional amount of serum to any patient whose temperature failed to fall below 101°F by mouth within eighteen hours of beginning treatment, or, if having fallen, it rose above this level within forty-eight hours. The extra amount of serum was also made available for patients having a pneumococcus Type I or Type II bacteremia, or who were pregnant or had been delivered within the previous seven days.

This plan was at first put into practice in restricted areas and when it was found feasible and acceptable to the physicians the services of the collaborators were discontinued. Since the latter part of 1935 serum has been available to all physicians throughout the State from near-by hospitals.

RESULTS OF SPECIFIC SERUM TREATMENT

In Table 3 are included only those Type I and Type II cases that received the serum treatment within 96 hours of onset and who were given not less than 16 cc. of serum or 20,000 units of antibody.

Early this year we began to distribute serum for Type V cases. The few that have been treated thus far with this product have shown a very favorable response, as shown in Table 4.

pneumonia serum, was recognition of the fact that even though a health department may be unable to prevent the spread of certain infections, it can do much to reduce the resultant loss of life. Long before it was possible to control diphtheria through immunizing procedures, health departments distributed antitoxin, and thereby achieved a decrease in deaths even if not in incidence. If the concentrated pneumonia serum as developed by Felton was capable of reducing the fatality rate for certain types of lobar pneumonia, why should not the State, through its official health agency, make the same services available for this disease, which claims almost two thousand victims each year, as had so long prevailed for diphtheria, which had formerly numbered its victims in the hundreds? Such was the basic guiding thought behind the Massachusetts pneumonia study.

Before any plans for general serum distribution could be considered, it was necessary to show that the serum could be used effectively in home practice and in the small hospitals. This was essentially a problem of field research. These early findings showed that, with proper instructions, the general practitioner could use serum as effectively as could the large metropolitan hospital centers. Such a conclusion was important inasmuch as the number of pneumonia patients who reached these large hospitals early enough to benefit much from serum was but a fraction of the total number of cases in Massachusetts.

During the latter part of the pneumonia study the coincidental development of the Neufeld method of typing pneumococci in the sputum provided rapid and simple laboratory procedures which were within the reach of any laboratory employing adequately trained personnel. Equally important was the elimination of the long delays that formerly attended most type determinations. The introduction of the Neufeld method furnished the key to the problem of controlled serum distribution in that it made it possible to restrict the distribution of serum to those who might reasonably be expected to profit from its use. Such a limitation was essential if so costly a serum was to be distributed at public expense. That the plan so evolved was administratively sound has been well shown by experience extending over the past two years.

Improvements in the methods of serum production were equally essential to the success of the Massachusetts program. These improvements were realized both as a part of and independently of the study so that the serum as distributed today is a more refined and more effective product than was that generally available in 1931.

The study would have been but a partial suc-

cess had it merely demonstrated certain administrative principles or elicited certain scientific truths. Its true success must be measured by the extent to which its findings could be applied in practice. It is therefore significant that with the completion of the five years of formal study, financed by the Commonwealth Fund, the Department of Public Health was able to take over as a part of its program the services which had been found to be essential for the continued manufacture and use of pneumonia serum. Thus the distribution of this serum has become as integral a part of the public health program of the State as is the distribution of other serums or the supervision of the milk and water supplies. The serum is now readily available in all parts of the Commonwealth, and the study has accomplished the ends for which it was designed.

Whatever success may have attended this study was due in large measure to the wise counsel and guidance of the advisory committee on pneumonia, composed of representatives of Boston University, Harvard and Tufts College Medical schools, the medical profession at large, and interested public health workers, and also to the hearty co-operation of the collaborating clinicians throughout the State. In even larger measure was its success due to the skill and ability of Dr. Roderick Heffron, who has served as field director from the beginning of the study in 1931 up to the present time. I am indebted to him for the statistical material contained in this paper.

The Final Report of the Massachusetts Pneumonia Study and Service, giving in detail the results of the five-year study, has been published,¹ and copies are available on request.

The educational work was carried on with the physicians throughout the Commonwealth through the State, county, and local medical societies. It was realized that the rapid advances in the newer methods of pneumococcus typing and serum production and concentration, with resulting changes in procedures used in the serum treatment of pneumococcus pneumonia, made this necessary, as otherwise the average physician would be unable to co-operate fully or take advantage of the serum offered to him. From the attendance at these meetings it is estimated that 75 per cent of the physicians outside the Boston area were directly reached in this way. Within metropolitan Boston a smaller percentage attended the meetings. All physicians in the State were circularized a number of times, and sent reports as the study progressed.

There has been a steady increase in the demand for pneumococcus typing since the work began. The demand for therapeutic pneumonia serum has likewise increased, and especially so since the latter part of 1935, by which time serum was avail-

ing in every instance where pneumococci other than Types I and II are found in the sputum

In addition, emphasis must be placed on the great need of taking a blood culture of every patient with pneumonia. The physician must know whether bacteremia exists, for in the presence of such a condition larger doses of serum are necessary to bring about the desired result, as serum is the only specific treatment known today which will counteract the effects of bacteremia and sterilize the blood stream.

In the first five years of the pneumonia study serum was used by about 387 physicians. Since that time, in a period of about eighteen months the number of physicians using serum has increased to approximately 1100, or about one in six of the total number in the State.

The fatality rate of serum-treated Type I cases has been a little higher since January 1 of this year. Blood-culture studies in the group suggest that possibly the pneumonia was of a more severe form than in previous winters. This may in part explain the increase in mortality. Another factor to be considered is that more physicians are using

serum and that many of them have not had the experience necessary to employ it most effectively. Possibly the higher fatality rate of 14 per cent in Type I cases during the past twelve months is a more accurate index of what the general practitioner may be expected to accomplish with serum than was the previous figure of 10 per cent, which was based on treatment of cases by a selected group of physicians who had previously been instructed in serum therapy.

We are now preparing serums for Type VII and Type VIII infections, and these will be ready for distribution in the near future. We shall then have therapeutic serum for five specific types of pneumococci available to physicians without cost to their patients. When physicians as a class become experienced in its use, it is not too optimistic to forecast a reduction of at least one half in the case-fatality rates for this group, which constitutes about 60 per cent of all lobar pneumonias.

546 State House.

REFERENCE

1. Hedron, R. and Robins, E. S. Final report of the Massachusetts pneumonia study and service 1931-1935. *The Commonwealth* 24:173, 1935.

PHYSICAL AND CLINICAL OBSERVATIONS ON THE USE OF MILLION-VOLT X-RAYS

RICHARD DRESSER, M.D.,* AND JACK SPENCER, M.D.†

BOSTON

X-RAY therapy is occupying a place of increasing importance in the treatment of malignant disease. In 1936, there were 3679 x-ray treatments given in one of the large hospitals in Massachusetts, whereas there were only 386 radium applications. During a corresponding period in 1937 the x-ray treatments in this institution increased to 4294 and the radium applications decreased to 290, that is, there was a 17 per cent increase in x-ray work and a 25 per cent decrease in radium work. A large percentage of the radium applications were made in cases of cancer of the skin. These cases could have been more effectively treated with modern x-ray apparatus.

This diminished use of radium is somewhat paradoxical. It has been the observation of most workers in radiation therapy that the shorter, more penetrating rays such as those obtained from radium give the best therapeutic results. This applies particularly to deep-seated neoplasms. In order, however, to deliver an effective amount of radiation to a tumor located near the center of the

body, the radiation must not only be composed of short wave lengths but its source must be placed at some distance from the body. Although the gamma rays of radium constitute the shortest wave lengths which have yet become available for cancer therapy, the application of radium at a distance is not practical because of its great cost and scarcity. It has therefore been the endeavor of physicists and engineers to produce, at comparatively moderate cost, x-rays which will approximate in wave lengths the gamma rays of radium and which will be available in quantities equivalent to the output of many hundreds of grams of radium element. Since the shortest wave lengths in an x-ray beam are dependent on the voltage at which the rays are produced, the problem resolves itself into the development, first, of a reliable source of high voltage and, secondly, of an x-ray tube which will operate continuously and reliably at this high voltage. The term "supervoltage" is commonly applied to x-rays which are produced at potentials greater than 200,000 volts.

This problem of supervoltage x-ray generation has been approached by a research group at the

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The importance of the administration of pneumonia serum early in the course of the disease is shown in Table 5. Our policy until recently

Table 4 *Fatality Rates of Cases of Type V Pneumococcus Pneumonia Receiving Treatment with Concentrated Serum within 96 Hours of Onset and Those Not Given Serum*

	NO OF CASES	DEATHS	FATALITY RATE %
Treated with serum*	17	1	5.9
Treated without serum†	337	109	32.4

*Massachusetts Pneumonia Study cases

†Cases collected from American literature.

has been to distribute serum only for use in patients who had been ill not more than four days. The experience of various investigators, however, has demonstrated quite consistently that although serum treatment is begun later than four days, it may in some instances save lives. In accordance

Table 5 *Type I Cases Treated with Serum: Number and Percentage of Deaths by Day on Which Serum Treatment Was Begun*

SERUM TREATMENT BEGUN	NO OF CASES	DEATHS No	%
1st day	183	26	14.2
2nd day	384	42	10.9
3rd day	294	40	13.6
4th day	182	37	20.3
Totals	1,043	145	
Average			13.9

with this evidence we have modified our plan, and while still stressing the importance of early treatment have made serum available for any case of pneumonia of the right type, regardless of the length of time the patient has been ill.

Of the grand total of 1341 Types I, II and V cases, 326 or 24.3 per cent were treated at home.

SERUM DOSAGE

We recommend the administration of at least 60,000 units for all Type I cases and 100,000 units for those of Type II, and additional doses of from 40,000 to 60,000 units at three- or four-hour intervals for all patients who have bacteriemia, are pregnant or have been delivered within seven days, are forty years of age or over, have involvement of more than one lobe, or whose treatment is begun on the fourth day of the disease or later. Similar extra doses are advised when the temperature does not fall below 101°F by mouth (102°F by rectum) within eighteen hours of beginning serum treatment, or when the temperature rises above that level within seventy-two hours after the initial drop.

BACTERIEMIA

Of a grand total of 1341 Type I, II and V cases treated with serum, 635, or 47.4 per cent, had blood

cultures done. About 26 per cent of Type I, 29 per cent of Type II and 24 per cent of Type V cases showed positive blood-culture results. As noted in Table 6, the fatality rate for the cases with positive blood cultures was high. The findings in our series suggest that the incidence of positive blood cultures increases with age, a phenomenon which may partially account for the high fatality rate in the older age group.

Table 6 *Type I and Type II Cases with and without Bacteriemia Treated with Serum: Number and Percentage of Deaths*

BLOOD CULTURES	TYPE I			TYPE II		
	NO OF CASES	DEATHS	FATALITY RATE %	NO OF CASES	DEATHS	FATALITY RATE %
Negative	340	28	8.2	113	17	15.0
Positive	112	32	28.6	47	22	46.8

Table 7 shows that when bacteriemia is present there is more marked proportional increase in the fatality rate in patients 0-49 years old (400 per cent) than in the older patients (200 per cent).

Table 7 *Fatality Rates of Cases of Pneumococcus Pneumonia in Different Age Groups Listed According to the Presence or Absence of Bacteriemia*

BLOOD CULTURES	0-49 YEARS OF AGE			50 YEARS AND OVER		
	NO OF CASES	DEATHS	FATALITY RATE %	NO OF CASES	DEATHS	FATALITY RATE %
TYPE I						
Negative	290	17	5.9	49	11	22.4
Positive	85	18	21.2	27	14	51.8
TYPE II						
Negative	87	8	9.2	25	9	36.0
Positive	34	13	38.2	13	9	69.2

PNEUMOCOCCUS TYPING

The demand for pneumococcus typing at the State Bacteriological Laboratory continues to increase, and is more than 25 per cent higher than it was two years ago when the study period ended. Over seventy hospital laboratories now have qualified technicians and are doing their own typing. These laboratories are supplied with diagnostic serums by the department. We estimate that specimens of sputum are sent to some laboratory for typing in about one fourth of all the pneumonia cases in the State.

A review of the typing figures and a careful survey of treated cases clearly indicate the need of a more intensive effort on the part of the physician to have determined the type of pneumococcus infecting the patient whom he is treating. When the first sample of sputum fails to reveal pneumococci, or the findings are questionable, other specimens should be submitted for examination. Further, second specimens should be sent for typ-

treatments during the first six months' period seems desirable. They are grouped as follows:

Cancer of the breast	21
Malignancy of the buccal cavity	15
Cancer of the bladder	17
Cancer of the cervix	11
Cancer of the prostate	4
Ovarian carcinoma	5
Cancer of the larynx	3
Renal tumors	2
Cancer of the esophagus	3
Hodgkin's disease	3
Carcinoma of the large bowel	3
Embryoma of the testicle	3
Miscellaneous	18

The irradiated breast cases have been either in the inoperable group or in that group showing recurrence after operation. Regression of local disease has been as prompt as one would expect after 200,000-volt therapy, but there have been less skin reaction and less roentgen sickness. In a case which was given an unusually large dose, a reaction which might be attributed to damage from radiation was noted in the lung. This patient, however, developed bone metastases, and it is not improbable that these changes were due to metastatic disease rather than to radiation pneumonitis.

There are certain advantages in treating carcinoma of the mouth and throat at very high voltage. Coutard³ has shown that in order to control malignancies in this region with 200,000-volt therapy, doses must be administered which actually destroy the outer layer of the skin and occasionally result in rather painful, slowly healing ulcerations. At higher voltage the same effective dose may be delivered to the tumor, but with no further skin effect than a mild, scarcely noticeable erythema. If indicated, the radiation may be repeated after an interval of several months, which is not possible following an adequate dose of 200,000-volt x-ray.

The group of bladder tumors has proved most interesting. In a recent review by Graves and Dresser⁴ of a series of cases of carcinoma of the bladder treated at 200,000 volts, it was found that little more than a moderate degree of palliation was afforded. The immediate results, however, from 1,000,000-volt therapy have been much more encouraging. All these cases have been hopeless from a surgical point of view or have shown recurrence after operation. In almost every instance there has been either partial or total regression of the tumor with symptomatic relief. With one ex-

ception there was no untoward general or local reaction.

Most of the cases of carcinoma of the cervix uteri have been previously irradiated either with low-voltage x-ray or radium. They have, therefore, constituted a very unfavorable group. A recent review by Meigs and Dresser⁵ of three-year results obtained at the Pondville Hospital by combined 200,000-volt x-ray and radium treatment has proved beyond doubt the value of this method. It is anticipated that a combination of x-ray and radium, using 1,000,000-volt rays instead of 200,000-volt, may lead to even more gratifying results.

Much palliation has been afforded in all the cases with carcinoma of the prostate, but in no instance has there been complete disappearance of the neoplasm.

One case of carcinoma of the esophagus is now entirely symptom free, presents a normal esophagus by x-ray examination, and is gaining weight. A second case has had no relief from obstruction and the patient has just been submitted to a gastrostomy. He has recovered satisfactorily from the operation, and further intensive radiation to the esophageal growth is planned.

It is the intent to irradiate reasonably large groups of cases with malignancies of various types so that statistical data as to the success or failure of this treatment will ultimately be available. Our observations thus far lead us to believe that in the treatment of deep-seated neoplasms the immediate results of 1,000,000-volt x-ray therapy, even though they may prove to be only palliative, are superior to those obtained with lower voltages. The regression or complete disappearance of new growths takes place with little or no untoward general reaction on the part of the patient, and apparently with less damage to normal tissues than has heretofore been observed.

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Massachusetts Institute of Technology from an entirely new angle. Through the generosity of the Godfrey M. Hyams Trust it has been possible to construct a new type of x-ray generator at the Collis P. Huntington Memorial Hospital. This unit has been described in a recent paper by Trump and Van de Graaff,¹ and another article dealing with the mechanical construction and physical characteristics of the rays produced has been written by Dresser, Trump and Van de Graaff.² During the first six months of operation 101 patients suffering with malignant disease have been treated, and certain physical investigations have been carried out. There are a number of mechanical advantages in this type of apparatus, and there have been obtained certain gratifying immediate therapeutic results which seem worthy of note.

The machine has been operated routinely at a constant potential of 1,200,000 volts, which we believe is the highest effective voltage ever used for therapeutic x-ray production. The average wave length of the beam approaches that of the rays of radium. The quantity of radiation has been estimated as equivalent to that which would be obtained from 2000 grams of radium element—an amount greater than all the refined radium in the world. The apparatus is mechanically as reliable as any of the low-voltage commercial x-ray units, in fact, during the first six months of operation it has been necessary to postpone treatments for only one day.

Although statistical results of the treatment of various types of malignancies will not be available for several years, we feel that certain pronounced differences which we have already noted between the results of this type of radiation and of the usual 200,000-volt treatment should be reported. The skin will tolerate twice as much x-ray delivered at 1,000,000 volts as it will at 200,000. Moreover, if equal doses of 200,000-volt and 1,000,000-volt x-rays are applied to the skin, about 20 per cent more of the latter will reach the center of the body. The combination of these two factors, that is, the greater skin tolerance and the greater penetrating power, allows the administration of more nearly adequate amounts of radiation to deep-seated tumors without appreciable damage to the superficial tissues. Following treatment with 200,000 volt x-rays many patients suffer from moderate to severe roentgen sickness. This is characterized by general malaise, loss of appetite, nausea and sometimes severe vomiting. There is surprisingly little roentgen sickness following million-volt therapy. This is well illustrated by the following case:

A patient with extensive cancer of the breast was irradiated at 1,000,000 volts through a large portal including the lateral aspect of the breast and the axilla. The medial portion of the breast was subsequently treated at 200,000 volts through a smaller portal. The dose administered was exactly the same with both types of radiation. The patient suffered no untoward symptoms of any kind following the 1,000,000-volt treatments, but experienced nausea and vomiting after each of the 200,000-volt exposures.

The diminution in roentgen sickness now makes it possible to irradiate many patients as ambulatory cases who otherwise would have to be hospitalized for several weeks.

Unfortunately, there is no yardstick with which to measure our results. Evaluations must be made after frequent and careful observations of the patients irradiated, and mental comparisons made with results obtained during a long experience with low-voltage x-ray therapy. It is our impression that satisfactory results are to be expected only in those tumors which have shown themselves to be in some degree sensitive to low-voltage radiation. The sensitivity of a tumor cannot always be predicted from its histology, and we are therefore obliged to irradiate many seemingly unfavorable cases in the hope that some of them will constitute the exceptions to the rule.

It is exceedingly important to treat with caution those patients who are in poor general condition or who have very extensive malignancies. Much unnecessary suffering may be caused if this rule is not followed. The radiologist soon learns, however, that careful handling of seemingly hopeless cases may occasionally produce surprising results. The first case treated on the 1,000,000-volt unit illustrates this point.

Having checked the machine as carefully as possible with ionization measuring instruments, a small group of patients was selected for trial dosage. The first patient chosen was one suffering from carcinoma of the larynx. He had been previously treated by radium implantation and by heavy doses of 200,000-volt x-rays. Even though we were dealing with a presumably radiosensitive tumor, the disease was progressing in spite of this therapy, and it was anticipated that the duration of life would not be more than a few weeks. Following repeated small doses of 1,000,000-volt x-rays, designed primarily to determine the skin effect, the patient to our surprise showed improvement. Radiation was then continued in somewhat larger amounts, and today the patient is clinically free of disease.

The anthesis of this case is one of a melanotic sarcoma recurrent after operative removal. It is well known that this type of lesion is exceedingly radioresistant. Although the tumor was heavily treated with 1,000,000-volt x-rays there was, as anticipated, no response.

A brief analysis of the 101 cases that received 824

tion is quite conclusive. Many cases with active pulmonary disease are observed which have positive stools with no intestinal lesion, and many others with tuberculous mesenteric lymph nodes or tuberculous peritonitis and no lesions in the intestine. This simply substantiates the general belief that in many cases the intestine is immune to tubercle bacilli in the stools. The fact that 34 per cent of the cases of intestinal tuberculosis occurring in the British Isles, where much of the milk is tuberculous, are primary lesions favors the ingestion theory.

There is considerable evidence that the tubercle bacilli are carried by the blood stream in many cases of enteritis, from a ruptured cavity in the lungs or from lymph nodes, as stated by Archibald,¹⁰ Calmette¹¹ and others. Cases with negative sputum and stools at least are very suggestive of transmission by the blood stream.

The initial lesion in the intestine in from 80 to 90 per cent of patients is in the terminal ileum and cecum (Brown and Sampson,⁴ Granet,³ Archibald¹⁰). The susceptibility of this region to the tubercle bacilli is thought to be due to the increased blood supply, the greater number of Peyer's patches and solitary follicles, and stasis of the fecal stream.

The ulcerative type of lesion in most cases extends upward in the ileum from the original focus, forming circular or girdle ulcers of the mucosa or, less frequently, longitudinal or multiple small ulcers. The edges of the ulcers are ragged and the floor is covered with tubercles. The wall of the intestine over the ulcer is often thickened, and the peritoneum is congested and covered with exudate and tubercles. Adherence of loops of intestine at the site of ulcers is common, penetration of ulcers through the muscular layers occurs, although not commonly. Perforation is a rare complication on account of adhesions at the ulcer site. Abscesses and fistulas are not uncommon. As the ulcers heal, obstruction of varying grades may occur, due to angulations and narrowing of the lumen resulting from adhesions or fibrosis of a girdle ulcer with stricture.

The hyperplastic type of disease develops in practically all cases in the ileocecal region, but in a small percentage it extends to other sites in the large intestine or in the rectum and anus. It is rarely if ever found in the hepatic or splenic flexures. Hyperplastic and ulcerative types of lesions may occur simultaneously in the same patient. Hyperplastic lesions are characterized by formation of a tumor, often of considerable size, resulting from the production of granulation tissue in the submucous and to a lesser degree in the subserous coats of the intestine. Ulceration of the mucosa may occur, more frequently the increased

thickness of the intestinal wall causes a narrowing of the lumen, resulting in obstruction. The adjacent lymph nodes are enlarged, increasing the size of the tumor and giving the gross appearance of carcinoma.

Intestinal tuberculosis in most cases has an insidious onset. Patients with pulmonary disease have a loss of appetite, mild indigestion, constipation or diarrhea, loss of weight, an unexplained slight fever, and abdominal pain which may be generalized but is more frequent in the right lower quadrant. The pulmonary lesion remains at a standstill or shows evidence of activation. Gastrointestinal x-ray studies at this stage are frequently inconclusive.

As the disease progresses, nausea and vomiting occur, abdominal pain more definitely located in the right lower quadrant and aggravated by eating, diarrhea, — often of a severe type, — distention and more marked loss of weight are observed.

In the hyperplastic type, — abdominal pain is more definitely located in the right lower quadrant in the early course of the disease. Later a tumor is palpable in this region, often with symptoms of obstruction. Many of these patients are subjected to abdominal exploration, when the correct diagnosis is established and an unoffending appendix is removed.

X-ray diagnosis in these cases is based upon the so-called Sierlin phenomenon, or a filling defect and hyperirritability of the cecum. A persistent irregularity and spasm of the ileocecal valve is also observed. In many cases there is a marked narrowing of the terminal ileum. The ulcerative type of disease is characterized by a segmentation and dilatation of distal loops, giving the appearance of a string of sausages.

The diseases most commonly considered in a differential diagnosis are cancer, regional ileitis, ulcerative colitis and nonspecific granuloma. In cancer the patients are usually older, blood in the stools is commoner, and emaciation and anemia are more pronounced than in intestinal tuberculosis. The symptoms of regional ileitis in its early course are suggestive of an acute inflammatory lesion or may simulate ulcerative colitis, obstruction, perforation, abscess and fistulas are later manifestations. Intractable diarrhea, characteristic stools and prostration help to distinguish ulcerative colitis. Nonspecific granuloma is frequently mistaken for hyperplastic tuberculosis, clinically and in x-ray studies. The gross specimen and microscopic section closely resemble those of tuberculosis. Wilensky and Moschowitz¹² state that many cases of nonspecific granuloma have been incorrectly diagnosed as tuberculosis by pathologists.

In the past fifteen years the results of the use of heliotherapy and ultraviolet rays in the treat-

INTESTINAL TUBERCULOSIS

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INTESTINAL tuberculosis occurs in the great majority of cases as a complication of advanced pulmonary disease. Treatment of the intestinal lesion in these cases is obviously of little avail as regards ultimate prognosis, although with modern methods improvement of the enteric disease is a not uncommon observation.

In the cases of intestinal tuberculosis without active disease elsewhere, the results of treatment are more favorable, but the mortality still remains high. One writer¹ has stated that our treatment of intestinal tuberculosis today is comparable to the treatment of pulmonary tuberculosis of ten years ago.

Routine gastrointestinal x-ray examinations in tuberculosis sanatoriums show that the number of cases with intestinal ulceration varies from 17 per cent (Veterans' Hospital, Sunmount, New York,²) to 38 per cent (Metropolitan Hospital, New York City³). Brown and Sampson⁴ at Saranac Lake made a clinical and x-ray diagnosis of ulcerative enteritis in 26.4 per cent of 5542 patients with pulmonary disease. They have checked a series of these cases at operation and autopsy and have found their diagnosis correct in over 90 per cent.

A still higher incidence of intestinal ulceration is found at autopsy in cases of fatal pulmonary tuberculosis. Brown and Sampson⁴ 60 to 90 per cent, Granet⁵ 72 per cent, Kaufman⁶ 90 per cent. Intestinal tuberculosis not only ranks the highest as a complication of pulmonary disease, but also increases the problem of treatment on account of the difficulty in maintaining nutrition. In many pulmonary cases the inception of intestinal symptoms is coincident with a downward course with fatal termination.

In our tuberculosis sanatoriums in Massachusetts, funds for routine gastrointestinal studies of pulmonary cases are not available. Statistics† from ten of these hospitals showing the incidence of tuberculous enteritis in pulmonary cases as compared with institutions where routine gastrointestinal studies are made are of interest. Of 6401 cases with pulmonary tuberculosis treated, a clinical diagnosis of intestinal tuberculosis was made in 391 or 6.1 per cent. In two sanatoriums‡ in Maine 538 pulmonary cases were treated in 1935-1936, 76 or 14 per

cent were diagnosed as intestinal tuberculosis. Statistics⁷ for Connecticut show 2007 cases of pulmonary tuberculosis treated from 1934 to 1936, in none of which was a diagnosis of intestinal tuberculosis made. At the Massachusetts General Hospital⁷ since 1900 there have been 195 cases diagnosed as intestinal tuberculosis, 9 with tuberculous appendicitis, 52 with rectal tuberculosis and 24 with tuberculosis of the anus.

At the Lakeville Sanatorium, which is devoted exclusively to extrapulmonary tuberculosis, we have treated 39 patients with intestinal tuberculosis. This small number is explained by the fact that we admit no patient with active pulmonary disease. During the same interval we have treated 82 patients with tuberculous mesenteric glands and 133 cases of tuberculous peritonitis.

State and federal statistics regarding the incidence of intestinal tuberculosis are not available, since tuberculous peritonitis, mesenteric lymph nodes and intestinal tuberculosis are grouped together. In these three groups there were 2501 deaths from 1912 to 1935 inclusive in Massachusetts.⁸ The highest number, 202, occurred in 1916, the lowest, 31, in 1934. In the United States⁹ there was a yearly average of 2200 deaths from these three diseases from 1930 to 1932, inclusive, which dropped to 1431 in 1935.

These statistics are subject to many errors, and obviously are not based upon intestinal tuberculosis seen as a complication of pulmonary disease. They are, however, decidedly hopeful.

The hyperplastic type of intestinal tuberculosis, characterized by a marked thickening or hyperplasia of the intestinal wall, occurs much less frequently than the ulcerative, since it is seldom found as a complication of pulmonary disease. Lockhart Mummery⁹ reported 100 cases of this type, in 76 of which no other tuberculous lesion was found. By many writers it is described as a primary tuberculous lesion. This statement has been questioned, since 50 per cent of children have bovine tuberculous foci and about 90 per cent of adults have tuberculous infections during their lives. An intestinal lesion may have its origin in an arrested focus in the lungs, the lymph nodes or elsewhere in the body.

The route of transmission of tubercle bacilli to the initial lesion in the intestine is still unsettled. In the presence of positive sputum or of bacilli in the stools or breast milk, the evidence for inges-

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‡Plymouth County, Westfield, Belmont, Rutland, Essex, Bristol, North Reading, Norfolk, Worcester and Springfield Health Department hospitals and sanatoriums.

§Western Maine and Central Maine sanatoriums.

signs of pulmonary disease were found. An enterostomy was done without benefit, and death ensued the following day. At postmortem, hyperplastic ileocecal disease and complete transposition of viscera were found.

Case 3 Mr McQ., aged 46, was admitted to the Moore Hospital on March 5, 1925. He had had general abdominal pain, indigestion without relief by food, and frequent attacks of severe pain in the right lower quadrant for 5 years. Hyperplastic ileocecal disease and numerous annular strictures of the lower ileum were found at operation. An ileostomy resulted in temporary relief. He was sent to a sanatorium, where he died in 1927.

Case 4 F C., a 28-year-old woman, was admitted to the Lakeville Sanatorium on January 14, 1937. In August 1933, an appendectomy had been done in the Salem Hospital, and was followed by a fecal fistula. In December, 1933, the fistulous opening was closed, but it promptly reopened. She was sent to the Massachusetts General Hospital, and in July, 1936, a transverse colostomy and repair of the fecal fistula in the rectosigmoid was done. The fecal fistula again reopened and a urinary fistula developed both of which still persist. Guinea pig inoculation at Lakeville gave a positive reaction. She now has a large firm tumor in the right lower quadrant, extending into the pelvis and apparently involving the bladder. Her general physical condition is steadily improving under the usual treatment with ultraviolet light despite the extensive local disease.

Case 5 L. R., a 21 year-old colored man, was admitted to the Lakeville Sanatorium in April, 1936, for tuberculosis of the 9th, 10th, and 11th dorsal vertebrae. Gastrointestinal x rays were taken at another hospital before admission, with a report of almost complete obstruction of the ileum from an old appendix abscess or tuberculous peritonitis. In June, 1936, a fusion operation of the spine was done by Dr. Z. B. Adams. Abdominal symptoms persisted, characterized by pain in the right lower quadrant and a gradually increasing tumor in this region, and in October, 1936, he was referred to me for marked signs of obstruction. He was relieved of his obstruction by conservative treatment, and at operation a resection of the terminal ileum and cecum and a lateral anastomosis were done. A very stormy convalescence followed, complicated by a fecal fistula which required closure. The patient is now free from abdominal signs of disease but has bilateral renal disease.

SUMMARY

1 Ulcerative enteritis is found postmortem in from 65 to 90 per cent of patients with fatal pulmonary tuberculosis. The hyperplastic type of intestinal tuberculosis occurs much less frequently, and in many patients no active disease is manifested elsewhere in the body.

2 There is considerable evidence that tubercle bacilli are transmitted by the blood stream. It appears that in the great majority of cases of intestinal tuberculosis the organisms are ingested and transmitted by the digestive tract.

3 The initial lesion in over eighty-five per cent of cases is in the Peyer's patches and solitary follicles in the terminal ileum and cecum. The process may spread upward in the ileum, characterized by ulceration. It may remain at the site of origin or extend distally in the form of hyperplastic disease or in combination with ulcerations.

4 The early symptoms are insidious and are characterized by digestive disturbances and pain in the right lower quadrant. The later stages are marked by severe gastroenteritis, and in many cases, the symptoms are suggestive of an "acute abdomen." Abdominal emergencies are the result of acute obstruction, tuberculous appendicitis, perforation and abscess.

5 The most effective treatment for the ulcerative type of lesions consists in suitable therapy of pulmonary disease so as to obtain a negative sputum and stop the flow of tubercle bacilli in the intestinal tract, ultraviolet-light treatment, and proper hygiene and diet. Hyperplastic disease is best treated in most cases by some type of exclusion operation, followed by ultraviolet radiation and later excision, if necessary. Primary resection should be reserved for the rare patient who is an excellent risk. Obstruction, appendicitis and perforation do not differ in their immediate surgical indications from similar conditions resulting from diseases other than tuberculosis.

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DISCUSSION

DR. JAMES W. JAMESON, Concord, New Hampshire. Dr. Moore's paper brings up a condition that is likely to be overlooked by the general surgeon unless he is connected with a tuberculosis sanatorium, because he is apt to associate intestinal tuberculosis with the advanced cases where there is extensive ulceration, intestinal obstruction, abscesses and fistulas or the hyperplastic form of tuberculosis. The diagnosis in these cases is relatively easy.

It is in the early stage of the disease that diagnosis is difficult, but when we realize that over 95 per cent of the cases with intestinal lesions have a positive sputum, we must not fail to consider an intestinal involvement in any tuberculous patient with abdominal symptoms. As only

ment of intestinal tuberculosis have been comparable to those of surgery in pulmonary tuberculosis. The greatest field of usefulness for light therapy is in the ulcerative cases, which prior to its introduction were considered almost hopeless. Brown and Sampson,⁴ have advocated its use even in the presence of advanced pulmonary disease. They have observed healing of intestinal lesions in the presence of progressive and even fatal pulmonary disease. In their series of 271 patients treated with ultraviolet rays they reported good results in 73 per cent. Our small series of cases at Lakeville Sanatorium are in most instances of the hyperplastic type of disease, and do not occur as a complication of active pulmonary disease. Our results with ultraviolet rays in these cases have been highly gratifying, although we do not use the intensive treatment advocated by Brown and Sampson.

Granet³ has shown that many cases of intestinal tuberculosis have a positive sputum and that few have a negative sputum. He advocates collapse therapy in the former if possible, in order to produce a negative sputum before the use of light therapy for the intestinal lesion.

Pneumoperitoneum has been of great benefit in the treatment of tuberculous peritonitis, and has been advocated for intestinal tuberculosis. Salkin,¹ of the Michigan State Sanatorium, has reported benefit in a high percentage of ulcerative cases. We believe, however, that this form of treatment is still in the experimental stage.

The field of surgery in intestinal tuberculosis is limited at present to the relief of intestinal obstruction, removal of the rare tuberculous appendix, an exclusion operation, or in selected cases resection of hyperplastic disease, and treatment of perforations, abscesses and fistulas.

Intestinal obstruction is a not infrequent occurrence in both the ulcerative and hyperplastic forms of intestinal tuberculosis. The treatment does not differ from that of obstruction from other causes, except that resection of the diseased intestine, if necessary, should be done at a later time.

Santy¹³ has reported a series of 20 cases of hyperplastic disease without obstruction in which a primary resection was done in 10 and an exclusion operation in the others. Light therapy was used in the cases treated by exclusion with much better results than in those treated by resection. Excision of the diseased segment was done at a later date if the disease was not completely arrested by light therapy. An operation which provides exclusion and anastomosis, with colostomy in certain cases, puts the diseased segment of the bowel at rest. With the addition of light therapy this appears at present to be the best method of healing the tuber-

culous process. In a certain number of patients healing of the disease with a functionless segment of bowel results. If an excision is necessary on account of incomplete healing, the operation is much less formidable than if done at first. The diseased bowel is usually found to be a fibrous cord of scar tissue. Nearly twenty years ago Archibald advised a bilateral colostomy in patients with tuberculous enteritis whose condition contraindicated resection.

A few cases of tuberculosis limited to the appendix have been reported. If the appendix is removed before contiguous organs are involved, a cure may be expected. Unfortunately, in most of these cases the tuberculous process is found at operation to have involved the terminal ileum and cecum. Cases of advanced inoperable ileocecal tuberculosis with severe pain may be greatly relieved by removal of a tuberculous appendix.

Perforation is a rare complication of intestinal tuberculosis, with a high mortality. Brown and Sampson,⁴ also Bérard and Patel,¹⁴ stated that it is found at autopsy in 3 per cent of patients who succumb to pulmonary disease. It occurs most frequently in the terminal stages. A clinical diagnosis is rarely made, and in most cases the patient's condition precludes operation. Ameuille and Duperrat¹⁵ reported 12 cases observed in four years, and cited from the literature 4 cases of recovery following operation. All these recoveries occurred in patients with minimal or no pulmonary lesions. Marconi¹⁶ published 21 cases of perforation collected in the literature, 5 of which recovered following operation and 16 of which died. He cited 1 case of his own which recovered following operation.

The more characteristic manifestations of intestinal tuberculosis are illustrated by a brief review of some of the cases in my private practice and at the Lakeville Sanatorium.

CASE REPORTS

Case 1 Mrs. A., aged 40, was admitted to the Moore Hospital on December 11, 1917. She had had active pulmonary tuberculosis and had been treated in a sanatorium. She was 6 months pregnant at the time of onset of acute symptoms. Increasing constipation for six weeks was followed by obstruction for 5 days before admission. At operation, loops of terminal ileum were adherent and an enterostomy was done proximal to the obstruction. Miscarriage ensued 12 hours later. Two and a half months later the diseased ileum was resected and an anastomosis was done. The patient's condition in May, 1937, was excellent.

Case 2 Mr. S., aged 30, who was admitted to the Moore Hospital on July 20, 1922, gave a history of general abdominal pain, indigestion, attacks of severe constipation and of vomiting, and loss of weight for the past 5 years. He had had no bowel movement for 3 days prior to intervention, and there were the usual signs of obstruction. No

Dana in 1886, and the first successful American case was reported by Abbe in the *Boston Medical and Surgical Journal* in 1896. This operation, known as rhizotomy, has long since fallen into disrepute because of the great overlapping of the sensory nerve supply. It was found necessary to cut at least three roots above a lesion, and if the disease was widespread the ordeal proved too great for most of these already debilitated patients.

Moreover, by 1911 Spiller and Martin had published their first case of chordotomy. This operation depends for its success on the fact that pain and temperature fibers after entering the cord cross over and pass up the cord in the anterolateral region. Our knowledge of this pathway begins with a suggestion by Gowers in 1879, which was more emphatically stated by Van Gehuchten in 1893, but it was Spiller's brilliant clinical proof in a patient that led in 1904 to his endorsing the procedure. The operation is quite simple and may be performed under local anesthesia, since dividing the pathway in the cord is not painful. The dura is opened, the arachnoid is incised, a dentate ligament is separated from the dura near the desired root, its dural end is seized in a clamp, and by pulling on this the cord is rotated until the ventral root is clearly seen. A cataract knife or the special hook and knife devised by Frazier are then used to divide the anterolateral bundle. The incision should start at the dentate ligament, enter to a depth of 2.5 to 3 mm., and emerge at the ventral root. A considerable number of such procedures have been done, Grant alone reporting 51 in 1930. The operation has its opponents and proponents. Stookey has shown relief with only a 1.5-mm incision, which he thought preserved the more deeply situated temperature fibers, but Foerster holds that in a unilateral procedure the incision must be very deep and must enter the gray matter if pain is to be obviated. Davis believes that the deeper incision into the gray matter is more apt to obviate pain, since it also divides certain sympathetic fibers there, which he thinks are the source of the pain in unsuccessful cases. The operation should be carried out from four to five segments above the uppermost involved lesion. It is more successful if bilateral, in which case different levels should be used on the two sides. It may be done in the lower cervical region, but is usually performed for lower spine or pelvic lesions, in which the upper thoracic level is simplest and safest. There are obvious dangers: hemorrhage may cause serious motor weakness, from 10 to 20 per cent of patients have bladder difficulty, which may be very bothersome, and in debilitated patients with a prospect of short life, the

risk may not be worth while. For traumatic lesions of the spine, however, and other benign conditions it is eminently desirable. More recently (1934) Dr. Tracy Putnam suggested division of the spinal commissure when the painful disorder was confined to the thorax and arm. Chordotomy for this area, placing the operation high in the cervical spine, is too dangerous, and rhizotomy of the upper cervical nerve renders the arms practically useless. Dr. Putnam has invented a small myelotome which can be inserted in the dorsal fissure and thus used to divide the fibers at the decussation. One can only say that the objections to the procedure would be its magnitude in patients obviously very ill.

Lastly, to combat this painful spinal condition, again usually due to metastatic carcinoma, we have relief by the subarachnoid injection of alcohol. This was introduced by Dogliotti in 1931, and is so simple and safe that in my opinion it will largely supplant the surgical procedures already outlined for extensive malignant disease in the pelvis. The considerations are simply that alcohol is lighter than cerebrospinal fluid and will therefore float upon it. The patient is placed on his normal side, and so angulated that the uppermost part of the cord contains the spinal roots by which painful stimuli enter the cord. By slightly tipping the patient ventrally, the motor root is further protected. From 1 to 2 cc of alcohol is then slowly injected, after withdrawing a corresponding amount of cerebrospinal fluid. Dogliotti used absolute ethyl alcohol, but following the suggestion of Dr. Tracy Putnam we have used a mixture of 60 per cent absolute ethyl alcohol and 40 per cent absolute methyl alcohol in most of our cases. The manner of action of the alcohol is unknown. Dogliotti believed that it destroyed certain fibers in the dorsal root. Perhaps like other anesthetic agents, it affects sensory nerves more than it does motor nerves. Our cases have been chiefly those with carcinoma of the cervix, bladder or prostate, causing pain from local pressure in the pelvis. Until more is known about how the alcohol acts, such a procedure should be confined to the relief of intractable pain in patients with advanced cancer. In our hands, 50 per cent of the cases have had highly successful results. Where incomplete relief was obtained the areas of anesthesia did not coincide with the areas of pain. This serves to emphasize the great importance of the position of the patient and the selection of the site for injection. For obvious reasons, alcohol is not so effective for the treatment of spinal metastases, and will possibly be reserved for intractable pain where the pain fibers enter over a small field. Thus chordotomy will still hold its place as a merciful pro-

a small proportion of tuberculous patients are treated in sanatoriums, one must keep intestinal tuberculosis constantly in mind, although the surgeon is less apt to see these cases than the internist.

My experience with intestinal tuberculosis has been limited to cases with tuberculous fistulas and to 1 case of the hyperplastic type, the results in both conditions being very unsatisfactory. The case of hyperplastic tuberculosis was that of a girl of nineteen with an active pulmonary lesion. I did a resection of the terminal ileum, cecum and ascending colon with end-to-end anastomosis of the ileum to the transverse colon. She lived about six months, and died from pulmonary hemorrhage without evidence or extension of the intestinal lesion.

DR. MOORE (closing) I am going to show a few x rays to illustrate the filling defects of the terminal ileum but more especially those of the cecum, the so-called Sterlin defect, which is considered characteristic of tuberculosis.

In regard to treatment, I should like to emphasize again that heliotherapy and ultraviolet radiation in the ulcerative type of disease have proved to be of great benefit. In hyperplastic intestinal tuberculosis, heliotherapy and ultraviolet radiation have not been used so extensively because this form of the disease is less frequently observed, and also because it is not commonly seen in sanatoriums. In conjunction with some type of exclusion operation the results have been decidedly encouraging as compared with excision of the diseased segment of intestine alone.

THE SURGICAL TREATMENT OF PAIN

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THE presentations which have preceded my attempt to discuss the surgical treatment of pain have made it clear that there are two types of pain arising through separate mechanisms. There is somatic pain, arising in relation to changes in the central nervous system, and there is visceral and vascular pain, apparently having to do with changes in the autonomic nervous system. Somatic pain follows topographic anatomy, repeats itself in the same area, does not radiate with recurrent attacks into new fields, returns each time with more or less the same intensity and is usually discontinuous in action. Patients suffering from trigeminal neuralgia (*tic douloureux*) are an example of somatic, central-nervous-system pain. Autonomic or sympathetic pain is fickle and capricious, it occurs in a less limited field, which it frequently overflows, it varies greatly in intensity with different attacks, is aggravated by the emotions and by barometric pressure, and it bears a more distinct relation to the individuality of the patient. Patients suffering with traumatic causalgia represent this type of pain.

Pain is the symptom that brings most patients to the doctor. Fortunately its cause can usually be determined and proper therapy for its relief instituted. Such an indirect attack on pain as the removal of biliary or urinary calculi which gave rise to it need not interest us here. We have only time to discuss a few examples of the surgical treatment of pain where the treatment is directed at the nervous system itself. The surgeon must always bear in mind this rule before any operation is

undertaken that has for its primary object the denervation of a painful part, he must prove to himself that a direct attack on the lesion is impossible. Such conditions are met with when the painful area is more extensive than the local lesion, as in widespread local extension of cervical cancer, or with bony metastases, and when there is referred or visceral pain and the real lesion is either difficult of access or incompletely understood, as in angina pectoris and dysmenorrhea.

SOMATIC PAIN

A direct attack on the central nervous system may be aimed at the peripheral nerve, the posterior nerve roots or the anterolateral tracts of the spinal cord, where the pain fibers are gathered together, transection of the spinal cord has even been performed (Cushing and Leriche). These procedures have been carried out largely as merciful procedures in patients suffering from hopeless cancer or from injury to the spinal cord.

In dealing with pain in carcinoma of the face and mouth, the contributions of Grant, Mixer, Adson and Fay describe the considerable relief that can be given by alcoholic injections of the second and third divisions of the fifth nerve, by intracranial division of the fifth and ninth nerves, or by intradural division of the posterior nerve roots of the upper three cervical nerves. Such procedures may be of great help to patients, particularly when slow-growing, non-metastasizing tumors are the source of the pain.

The more usual application of this form of surgery is seen with malignant disease in the pelvis, which is inoperable, radioresistant or metastatic to the spine. Section of the posterior nerve roots was first proposed for this dilemma by

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treatment of angina pectoris was not popularized. In 1923 Coffey and Brown, of San Francisco, related their experience with 5 cases as showing that removal merely of the superior cervical sympathetic ganglion, or even division of the main branch from this ganglion to the heart, sufficed to ameliorate pain in angina pectoris. These successful results with such a simple procedure led to a general practice of operation on patients suffering with angina pectoris.

In addition to these surgical procedures there arose the method of blocking the white rami at the point of emergence from the bony spine with procaine or alcohol. This method, introduced by Mandl and Swetlow, has been ably defended and popularized in Boston by Dr. James C. White. Its simplicity, in spite of the danger of the use of alcohol so close to the pleura and spinal cord, commends its trial, and the published figures reveal results which seem comparable to the more serious and cumbersome surgical methods. Even if these procedures fail ultimately to prove of great practical value in clinical medicine, the stimulation of the study of cardiac pain and the innervation of the heart will have been a distinct benefit to the profession.

Can we interpret intelligently the results obtained by such widely differing procedures? To do this one must appreciate what sympathetic fibers reach the heart and could be utilized by afferent stimuli. We know from the work of Cannon and his pupils that sympathetic fibers extend from the heart to the central nervous system, from the first dorsal to as low as the fifth or possibly the seventh dorsal sympathetic ganglion. We also know from the work of Langley, Gaskell and Ranson that the cervical sympathetic system has no sensory fibers above the cervical ganglia. Weighing this information in relation to the surgical procedures outlined above, we must interpret relief from simple superior cervical ganglionectomy as due to the effect upon the vessels supplying the heart. We know from adequate studies and surgical observations that all vessels are sensitive, and there is proof that the sensation is carried in sympathetic fibers. We also know that these fibers control vasomotor tone in relation to the coronary vessels, however, there is no general agreement on their function as vasoconstrictors. It may be that Coffey and Brown, by excising the superior cervical ganglion merely stabilized the coronary tone for the time being, and that this explains their favorable results.

When we come to interpret the results of the Jonnesco procedure, which may produce both a motor and a partial sensory effect, or the results accruing from cutting the white ramus to the upper two dorsal ganglia, or from injecting alcohol

in order to interrupt these same conduction fibers, it is clear that if all connections with the heart are to be done away with we must extend our procedure from the first through at least the fifth dorsal level. Why, then, have favorable results been obtained? We can only state that this question cannot as yet be answered satisfactorily.

My own experience in this field comprises a considerable number of surgical attacks upon the sympathetic apparatus in the neck and upon the upper two dorsal ganglia. I have never been convinced that the relief afforded by such a procedure was complete or lasting. It is certain, however, that it has been satisfactory in a high percentage of cases. If we consider the mental as well as the physical anguish of patients with true angina pectoris, and remember that their lives are chiefly given over to waiting for the next attack, we must acknowledge that this procedure is highly desirable.

* * *

This short recital of a few methods for relieving pain emphasizes the inadequacy of our therapeutic measures. At the same time, it is apparent that when a direct attack upon a lesion causing pain is impossible, there are at least two alternate methods of possible relief,—one through section of some part of the somatic, and the other through a similar procedure on the autonomic nervous system,—which permit us to offer some help to our patients.

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cedure in certain cases of widespread spinal involvement.

VISCERAL PAIN

Those who walk in this field still tread a mysterious pathway, and it may be well to restate certain accepted principles

1 The internal viscera are sparsely supplied with sensory neurons

2 The internal viscera are liberally supplied with fibers from the sympathetic or parasympathetic systems

3 The internal viscera are relatively insensitive.

4 We must conceive as an *adequate stimulus* new factors, quite different from those we commonly consider as giving rise to pain. This point requires elaboration, since progress will be difficult unless the new concept is clear to us. Thus, the internal viscera are as a rule insensitive to cutting and burning but are sensitive to changes in tension. This should have been suspected earlier on teleologic grounds alone, since an internal viscus would not be exposed to cutting or burning but would constantly undergo a shifting tension. But this doctrine of an adequate stimulus is not in itself final for visceral pain as related to special nerve fibers, for we see examples of pain from the stimulus of highly specialized nerves, such as pain in the eye from sudden exposure to intense light.

5 The sympathetic nervous system has both afferent and efferent pathways. The afferent fibers appear to pass from the viscera to the cord straight through the paravertebral ganglia without synaptic connections, entering the cord by the white rami of the spinal nerves and terminating in its gray matter. Efferent neurons in the spinal cord emerge with the ventral root and pass by way of the white rami to the sympathetic ganglia. Thus the white ramus constitutes the sole motor connection between the spinal cord and the sympathetic trunk.

6 Certain experiments, notably those of Davis and of Weiss and Davis, indicate that the somatic sensory apparatus must be intact for the perception of pain, even if we are satisfied that the original impulse travels by way of the sympathetic system. The pain of such an impulse, according to Davis, travels up an afferent pathway to the cells in the gray matter, along an afferent pathway to the paravertebral sympathetic ganglion, and from this synapse outward to the periphery, where a change occurs that stimulates the peripheral sensory nerve ending, from it the impulse passes back to the cord and upward to the cerebral centers, where pain is recognized.

7 The connections of the sympathetic nervous system afferent fibers in the cord are still unsatisfactorily demonstrated.

Two of the most important procedures for the relief of visceral pain concern the alleviation of pelvic pain and that associated with angina pectoris.

Relief of pelvic pain by sympathetic neurectomy
In 1899 Jaboulay discussed operation on the sacral sympathetic nerves for dysmenorrhea, but the operation was not popularized until Cotte's article in 1925. The procedure involves the removal of the superior hypogastric plexus and the presacral nerve. This plexus and nerve represent part of a lower splanchnic system deriving fibers from the aortic plexus, which is formed by preganglionic fibers from the celiac ganglion and lumbar trunks. The presacral nerve is thus comprised of postganglionic fibers which supply the bladder, rectum and part of the pelvic genitalia. Removal of the presacral nerves and associated fibers, with or without partial denervation of the 4 or 5 cm of iliac arteries, has been carried out largely by gynecologists, but also by neurosurgeons, in an attempt to relieve the pain of inoperable cancer and chronic painful infection in the pelvic viscera. Learmonth has paid particular attention to the results in this field. The operation consists in opening the peritoneum over the bifurcation of the iliac arteries and cleaning out all the fibers found in this triangular area. The operation has been loudly acclaimed by many gynecologists, but in our hands has not given more than 50 per cent of good results. Learmonth has had some satisfactory results in the relief of pain of intractable cystitis and in inoperable cancer of the bladder. But Chievitz* of the Finsen Institute in Copenhagen and others have found that the procedure is by no means so reliable as chordotomy, and have abandoned its use in cancer. Presacral neurectomy is followed by little disturbance of function except for sterility, though not impotence—in man. There is no alteration of the normal menstrual cycle, and pregnancy is not affected.

Relief of Pain in Angina Pectoris by Procedures that Interrupt the Sympathetic Pathways
This constitutes perhaps the earliest attempt to interrupt afferent impulses over the autonomic nervous system. It began with a suggestion made by Francoir-Franck in 1899, but was first practiced by Jonnesco in 1916. The original procedure was elaborate, consisting in the removal of the three cervical ganglia and the stellate or first dorsal ganglion on both sides. Chiefly because of the technical difficulties, and in spite of the fact that Jonnesco's first case presented a most satisfactory result, the operative

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in the hypothalamus seemed to lack the necessary finesse, Hess² has worked out a precise method for stimulating the various structures of this region. By his method he obtained in animals marked decrease and increase in blood pressure and heart rate, changes in the frequency and amplitude of respiration, production of salivary flow, deglutition, vomiting, defecation and micturition, changes in the width of the lids and pupils, the nictitating membrane and the secretion of tears, and atony and increase in tone of the muscles. Sleep was never produced by stimulation of the hypothalamus, but was regularly obtained by stimulation of the confines of the subthalamus and thalamus.

Action Potentials of the Brain

From study of the action potentials of the brain in 23 persons, Davis and Davis³ conclude that different people show different patterns of activity but that each reproduces his own characteristics. The individuality is not completely like that of a fingerprint, for cerebral activity is labile and dynamic, and the characterization is essentially statistical. The cortical electrogram apparently conforms to the biologic law of similarity of identical twins. Whether this is an organic hereditary feature is not known.

Walter⁴ studied the electroencephalograms of 7 cases of brain tumor before and during operation. Large, slow waves involving the whole cranium were observed when the patients were under ether and in cases of increased intracranial pressure. After reduction of this increased pressure the slow waves were restricted to the areas of the tumor. Localization by the study of the slow waves is possible only when the tumor involves or affects the cortex itself, but the waves do not arise from the tumor but from the cortex. Although the region of the tumor was found in 4 cases, this method of study can be only supplementary to the other diagnostic procedures.

Experimental Catalepsy

Ingram, Barris and Ranson⁵ were able to produce transient and prolonged catalepsy (plastic rigidity of the muscles) in cats by means of experimental lesions in the hypothalamus. Catalepsy lasted from seven to thirty days. In some cases lesions involving the caudal part of the hypothalamus and the upper part of the mesencephalic tegmentum resulted in a syndrome characterized by initial somnolence, persistent loss of motor initiative, marked disinclination to walk, acceptance of passively induced poses, indisposition to eat when hungry and vacuity of expression. Many animals showed a suppression of emotional reactions. Study

of the experimental lesions indicates that the symptoms were caused by damage to some structure or structures in the neighborhood of the mammillary bodies, such as the posterior hypothalamic nucleus, the supramammillary area, the lateral hypothalamic area and the region just caudal to the mammillary bodies.

DIAGNOSTIC STUDIES

Sense of Smell

Elsberg⁶ has carried out extensive quantitative studies on the physiology and pathology of the olfactory sense by means of a special technique, in which blast and stream injections of coffee or citral are made into the nostrils at a known volume rate and pressure. The duration of olfactory fatigue was found to depend on the number of blast injections, the frequency of injection and the volume of odor injected in each blast. The minimum identifiable odor (MIO) is also an important figure representing the smallest number of cubic centimeters of the odorous substance required for identification when injected into one nasal passage. In a clinical application of these tests on 47 verified cases of brain tumor, in or under the frontal lobes, Elsberg¹⁰ was able to localize the growth in 46 instances. In 25 of the patients the tumor was extracerebral and lay underneath one or both frontal lobes. In these cases the MIO was elevated on one or both sides, while the duration of fatigue produced by stream injection was not prolonged beyond the normal. In 11 patients the growth was within the substance of one or the other frontal lobe, in these the MIO was elevated on the side of the tumor and the duration of fatigue was prolonged on the same side. In a patient with an intracranial tumor, in whom the MIO was elevated but the duration of fatigue was not prolonged, the growth was situated underneath the corresponding frontal lobe. The author concludes that the tests of olfactory acuity and olfactory fatigue by blast injection and stream injection of odor are of value for the localization of tumors in or under the frontal lobes.

Value of Hyperpnea in Diagnosis of Certain Nervous Conditions

This test has been carried out by Massion-Vernory¹¹ as an aid in the anatomical location and evocation of signs and symptoms in certain nervous diseases. He found the test positive in 11 per cent of cases of cryptogenic epilepsy and in 37 per cent of cases of organic epilepsy. He was able to precipitate a convulsion after seventeen minutes in a patient who showed no signs of tumor. In this case the convulsion pointed to a focal

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PROGRESS IN NEUROLOGY IN 1936

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THE literature in the field of neurology during 1936 contains many topics of both physiological and clinical interest. Investigations on the complex functions of the hypothalamus continue unabated. From many laboratories the study of cerebral activity, both normal and abnormal, by means of electroencephalography is yielding interesting and valuable information. Elsberg's quantitative tests of the olfactory sense appear to be of definite help in the localization of lesions of the frontal region. Many other aids in diagnosis of neurological syndromes are described. No unusual therapeutic advances are reported.

PHYSIOLOGIC AND PATHOLOGIC STUDIES

Relation between the Cerebrum and the Cerebellum

The experiments of Aring and Fulton¹ throw light on the physiological relation between the frontal lobes and the cerebellum—two parts of the brain which may be confused in the localization of brain tumor. The authors have demonstrated that complete decerebellation in monkeys results in tremors in the head, hands and legs, the tremors being restricted to voluntary movement. Hypotonia, a symptom usually ascribed to cerebellar disease, was never observed, nor was flaccidity after complete removal of the cerebellum. Following severance of the contralateral cerebellar peduncles and removal of the excitable regions of the cerebral cortex (Areas 4 and 6a), ataxia associated with voluntary movements in the affected extremities was abolished. When the premotor cortex (Area 6a, upper part) was removed subsequent to severance of the contralateral peduncle the cerebellar signs were accentuated. On the other hand, the cerebellar disturbances were temporarily abolished and permanently depressed when unilateral extirpation of Area 4 was done subsequent to a contralateral cerebellar lesion. From these observa-

tions the authors conclude that the premotor cortex is the part of the frontal lobe most intimately concerned in compensation for cerebellar deficit.

Hypothalamus—Physiology

Having produced minute lesions in cats with the Horsley-Clarke apparatus, Frazier, Alpers and Lewy² concluded that mesially placed bilateral lesions on the floor of the third ventricle result in complete loss of temperature control and that laterally placed lesions, whether bilateral or unilateral, cause only transitory and fleeting disturbances of temperature regulation. The vital area for temperature regulation in the hypothalamus is in the floor of the third ventricle, corresponding to the anterior hypothalamic nucleus in cats and to the substantia grisea in man.

That the hypothalamus is important in controlling temperature is supported by the findings in 2 cases reported by Alpers.³ Temperatures of 106°F and 107°F respectively occurred just before death in these patients, both of whom had been operated on for suprasellar cysts. Autopsies showed in each case destruction of the floor of the third ventricle, especially in the substantia grisea area.

Confirmation that the hypothalamus is a sympathetic center was shown by Crouch and Elliott,⁴ who utilized electrical stimulation of that region of the brain in twenty cats. The greatest rises in blood pressure were obtained by stimulating the anterior and lateral hypothalamic nuclei. Changes in respiration of various types were obtained, especially when the anterior, lateral and posterior hypothalamic nuclei and the lateral tegmental nucleus of the mesencephalon were stimulated. Dilation of the pupil was induced by stimulating the whole hypothalamus, but was best obtained from the lateral area.

Because previous methods in localizing centers

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Lennox, Gibbs and Gibbs¹³ have also demonstrated that electroencephalography is an aid in the evaluation of the various means of treatment, for example, pentobarbital and sodium bromide prevent or alter the pathologic activity associated with a seizure. In doses which are sufficiently large to modify the electrical activity during normal periods, these drugs prevent or modify the activity associated with a seizure of petit mal.

Surgical Therapy of Epilepsy

The surgical therapy of epilepsy is discussed by Penfield.¹⁹ In idiopathic epilepsy, removal of the sympathetic nerves which follow the arteries to the brain has been attempted, but the results have been disappointing. Penfield states that there is no proof that vasomotor phenomena actually cause the attacks. Removal of the carotid body and denervation of the carotid sinuses should be carried out only when a specific hyperactivity of the carotid sinus exists. Subtemporal decompression is often adequate to correct rare cases of subdural exudations. Penfield finds that following head injury epilepsy is ten times more frequent in cases in which the dura is lacerated. In these instances it is probable that the seizures result from subsequent formation of a meningocerebral cicatrix. Progressive contracture may be followed by convulsions as long as from fifteen to twenty years after the injury. Clean removal of such a scar without subsequent cicatrization, is possible. Of 22 such cases operated on, 46 per cent showed freedom from attacks and 33 per cent showed marked improvement in a five-year period.

MIGRAINE

Further favorable results with ergotamine tartrate are reported by O'Sullivan,²⁰ who followed 89 patients who had experienced over a thousand episodes. In only 8 did the drug fail to relieve the attacks either completely or partially. Ten other drugs failed to relieve them. The author found that the intramuscular route was the most effective. A dose of 0.25 mg is sufficient for an initial injection, to be repeated in two or three hours if no relief is obtained. For oral use the dose is 1 mg. For the best results the drug should be given as early in the attack as possible. Untoward effects of the drug, such as nausea and vomiting, may be relieved by a simultaneous injection of atropine (1/100 gr) or calcium gluconate intravenously. O'Sullivan's experience with ergotamine in migraine coincides with that of Lennox, von Storch and Solomon,²¹ who found the drug effective in aborting individual migraine headaches in about 90 per cent of cases. Of 46 patients having non-migrainous headaches, 15 per cent were relieved, 63 per cent were unrelieved and 22 per cent were

made worse. Of 38 persons without headache who were given the drug, 16 per cent developed headache.

MYOPATHIES

Myasthenia Gravis

The pathologic physiology of myasthenia gravis is considered by many a deficiency of acetylcholine liberated at the myoneural junction or an increased destruction of acetylcholine by cholinesterase, with a resulting disturbance in normal contraction of muscle. If this is so, the efficacy of prostigmin is probably due to a destruction of the cholinesterase, which enhances the effect of acetylcholine produced in the body. In addition to the effectiveness of prostigmin, temporary amelioration of symptoms is obtained by glycine, ephedrine or benzedrine, and potassium chloride, the latter being given in 3-gr doses four times a day at two-hour intervals. Although prostigmin may cause some relief of muscular weakness in diseases other than myasthenia gravis, the amelioration in the latter disease following its injection is so striking that Viets and Mitchell²² find it a useful test in differentiating the disease and other conditions in which muscle strength is greatly impaired.

According to Norris,²³ changes in the thymus gland occur frequently in cases of myasthenia gravis, gross and pathologic alterations having been reported in 50 per cent of autopsied cases, including 2 of 4 cases observed by him. Various degrees of epithelial hyperplasia are found, when extreme it forms a localized and often encapsulated tumor-like mass, with obliteration of the usual lobular structure of the thymus. Norris believes that myasthenia gravis is best regarded as a disturbance of the neuromuscular mechanism, possibly on an endocrinal basis, rather than as a primary disease of the striated musculature or as one following metastases from a malignant thymus. Muscle lymphorrhagia (collections of lymphocyte-like cells in the muscles) appears to be a characteristic lesion of myasthenia gravis, having been found in two thirds of Norris's cases.

Muscular Dystrophy

The therapeutic results of glycine in 300 cases of muscular dystrophy hardly exceed those obtained from other forms of therapy, particularly pilocarpine-epinephrine, according to a survey of the literature made by Braestrup.²⁴ He treated 5 patients with muscular dystrophy, 4 with neurologic diseases affecting the muscular system and 4 with normal muscular systems. Fifteen grams of Merck's glycine was given twice daily in every case. In 1 of the 5 cases of dystrophy an undoubted improvement occurred, no benefit was observed in the others or in the neurologic cases. Increase

lesion in the right frontal area. Hyperpnea was also useful in bringing out pyramidal tract signs, such as in a case of cerebral thrombosis which showed normal reflexes before the test. The classical signs of Parkinsonism were also increased by hyperpnea in a large percentage of cases. The same was true of the signs of Sydenham's chorea. The test may also help to confirm the diagnosis of multiple sclerosis, of syringomyelia and of combined-system-disease.

Cerebral Angiography

By means of injecting thorotrast into the common carotid artery, Moniz^{12, 13} has made more than 700 cerebral angiographies with no mishaps. He has refined his technic so that he is able to take arteriograms and phlebograms, including those of the cranial sinuses, in rapid succession. In order to outline the vessels in the posterior fossa, Moniz injects the subclavian artery. In the presence of lesions which compress neighboring vessels, definite distortions of the vascular tree are observed. For example, lowering of the carotid trunk may be diagnostic of a frontal lobe tumor, while elevation may be due to chiasmal tumors. Various other specific distortions of the vascular tree are described, being due to lesions in the posterior part of the frontal lobes or tumors of the parietal lobes, anterior temporal lobe or cerebellar pontine angle. By means of angiography, aneurysms and angiomas are diagnosed preoperatively. Three types of angiomas can be identified: arterial, venous and arteriovenous.

Diagnosis of Tumors of the Corpus Callosum by Encephalography

Of a series of 3000 air studies made by Dyke and Davidoff,¹⁴ a diagnosis of tumor of the corpus callosum was made or suggested in 8 cases. Three cases were verified by necropsy, and in 2 diagnosis was confirmed by operation. Since there is no characteristic neurological syndrome by which the diagnosis can be made, the encephalographic evidence pointed out by these authors is of definite aid. The characteristic features of this condition as seen in the encephalogram are as follows: separation and asymmetrical distortion of the lateral ventricles without displacement of the ventricular system as a whole to either side, a sharply circumscribed defect in the dorsal margin of one or both lateral ventricles, occasional failure of one lateral ventricle to fill with gas, distortion of sulci and convolutions on the medial aspect of the brain, and deformity or obliteration of the dorsal and rostral portions of the fourth ventricle. The authors also point out the differential signs of other lesions which resemble tumors of the corpus callosum.

Changes in Physical Signs in Cerebellopontine Angle Tumor Following Lumbar Puncture

Helfer¹⁵ reviewed 16 cases of acoustic tumor in which a lumbar puncture had been done. In 10 there was found to be an increase in physical signs after the removal of fluid. The author recommends that in cases of unlocalized lesions in which spinal fluid is removed the patient be re-examined for more definite or new signs after the puncture. An increase in signs following lumbar puncture has also been noted in extramedullary cord tumors.

EPILEPSY

Physiology and Pathology

On the basis largely of personal experience, Lennox¹⁶ discusses the physiologic alterations of the body which may modify the frequency or severity of epileptic attacks. The induction of alkalosis by means of hyperpnea or by ingestion of large amounts of alkali tends to precipitate attacks, whereas acidosis diminishes the spells in certain individuals. The state of water balance in the body is also an important factor. The theory of vascular spasm is open to serious criticism, since records of patients taken immediately before and during spontaneous and induced seizures showed no decrease in cerebral blood flow. The author's experiments also show that during seizures there is no interference with the oxygen consumed by the brain. An acute decrease in the oxygen supply, however, may precipitate a seizure and an acute increase may inhibit it. The marked changes in the electrical potentials in the brains of epileptic patients and in those of normal individuals during the induction of alkalosis by hyperpnea, of anoxemia by breathing nitrogen, or of cerebral anemia, indicate that knowledge of the pathogenesis of epilepsy rests on ascertaining the physicochemical processes involved in the electrical activity of the neuron.

Gibbs, Lennox and Gibbs,¹⁷ experimenting with electroencephalography, find that the characteristic three-a-second wave and spike pattern, which they had previously described, is pathognomonic of attacks of petit mal, and that furthermore the frontal lobe is more intimately connected with the source of pathologic electrical activity associated with petit mal than is any other cortical area accessible from the surface of the head. That the technic used by these authors is adequate in localizing the region of a disturbance in an attack of grand mal was demonstrated in a patient whose attack began with a right Jacksonian seizure; the abnormal electrical activity appeared in the record from the left motor cortex before it appeared in the record from the right cortex.

Reduction of Cerebrospinal Fluid Pressure by Certain Solutions

In a study on the relative values of caffeine, hypertonic dextrose and saline solutions in reducing the cerebrospinal fluid pressure in normal and in neurologic cases, Blau²² comes to the conclusion that saline solutions are the most efficacious. He found that hypertonic dextrose solution caused only a temporary fall in pressure, and in only some of the cases. The effect of caffeine in depressing the pressure was also transient. Saline, 100 cc of a 15 per cent solution, caused a fall in pressure in all cases, persisting for the full length of the experiment. No deleterious effects were observed.

Effect of Blood in the Subarachnoid Space on the Cerebrospinal Fluid Pressure

As a result of their experiments on dogs, Parker and Lehman²³ found that in lacerations of the brain the cerebrospinal fluid pressure varies directly with the amount of blood that escapes into the subarachnoid space, and not with the amount of bleeding within the cerebrum. This is probably due, the authors believe, to the increase in osmotic pressure of the fluid resulting from the introduction of blood proteins.

AFFECTIONS OF THE MENINGES AND SKULL

Spinal Arachnoiditis

This condition, which is usually diagnosed as cord tumor, is described by Elkington,²⁴ who analyzed 41 cases. The etiology is very obscure. Of 41 patients, 18 had no previous illness or injury which could be found to be related to the spinal condition. Of the remaining 23, a history of spinal trauma was obtained in only 9, in 3 cases the meningeal changes were confined to the neighborhood of the damaged vertebrae, in 3 cases infection aggravated the trauma, 8 cases showed a history of severe infection, including in 2 of them meningococcus meningitis. A history of syphilis was obtained in 4 men. Any part of the cord or cauda equina may be involved either focally or diffusely. The onset may be rapid or gradual. At the onset either pain of various degrees may occur, or as in many cases, the first symptoms may be those of spinal cord compression. The signs are essentially similar to those found in cord tumor. In 10 cases some abnormality of the spine was detected clinically, either tenderness on pressure or percussion over the affected area, or spinal rigidity. Complete block was found in 1 case, a partial block in 2. The total protein was estimated in 21 cases: it was normal in 11, slightly elevated in 4, and in 5 greatly elevated, the latter ranging between 110 and 200 mg per cent. The prognosis is grave, but least so in cases oper-

ated on early, before irreversible changes have occurred in the cord itself. There was a satisfactory outcome in 7 of the 24 cases in which the subsequent course was known.

Selinski²⁵ has reviewed 8 cases of disseminated spinal arachnoiditis. A variety of associated conditions suggests that the disturbance is not a specific response, but that a variety of agents may produce a reactive inflammation of the pia arachnoid. The author states that of the nonsurgical measures high voltage roentgen therapy gives the best results.

Meningococcus Meningitis

Hoyne²¹ states that in the treatment of meningococcus meningitis the intravenous administration of serum or antitoxin is more efficacious than is the intraspinal route. Among 66 patients who received no intrathecal therapy the mortality rate was less than 12 per cent, in contrast to from 35 to 90 per cent when intraspinal treatment was used. For intravenous use the serum or antitoxin is diluted in 10 per cent dextrose or physiologic salt solution of at least twice the volume of the medicament, to which from 5 to 15 minims of epinephrine has been added. The mixture is kept at body temperature, and is given by gravity at the rate of about a drop a second. The dose of the serum is from 150 to 300 cc. an injection depending on the patient's age. Hoyne prefers Ferry's antimeningococcic antitoxin, from 50,000 to 100,000 units being given at a time. He believes in the superiority of intravenous over the intrathecal treatment, on the assumption that meningitis is a bloodstream infection with an accompanying toxemia, rather than a disease process localized in the central nervous system.

Treatment of Brucella Meningitis

Poston and Smith²² report 2 cases of this type of meningitis, which they treated intrathecally with fresh human immune serum. They describe a special technic which enabled them to isolate the organism in the spinal fluid. They state that *Brucella* infection should be suspected in cases of atypical meningitis. It can be treated by human serum obtained from persons who have been actively immunized by *Brucella*, or possibly from convalescent patients who have high agglutinating titers in their blood serums for the specific organism isolated. Patients who have no agglutinins for *Brucella* in their blood after recovery should be immunized with their own organisms so as to prevent an occurrence of the infection.

Calvarial Hyperostosis

Moore²³ has found various types of thickening of the calvarium in a study of several thousand

in the creatinuria occurred in all the cases following the administration of glycine, indicating that such a change is not specific for dystrophy

DYNAMICS OF THE CRANIOVERTEBRAL CAVITY

Physiology and Pathology

By the technic of jugular and carotid punctures and Gibbs's thermoelectric blood flow method, Loman and Myerson²⁵ have investigated some of the dynamic phenomena occurring within the human craniovertebral cavity. In contrast to the orthodox statements made regarding the physical make-up of the cavity the authors, after stressing the relative ease in which dynamic conditions on one side of the cranial and vertebral cavities are reflected to the other side, mainly by virtue of the changes occurring in the venous system, prefer to designate the craniospinal container as semirigid. They give the following summary of intracraniospinal pressure relations and changes in blood flow and gaseous metabolism of the brain under normal and abnormal conditions

(1) The cerebrospinal fluid pressure directly follows either a change in cerebrospinal venous pressure or a change in caliber of the cerebrospinal veins. The cerebrospinal fluid pressure is only indirectly related to changes in arterial pressure. Thus, a rise in arterial pressure does not affect the cerebrospinal fluid pressure unless the venous pressure, as a result, becomes increased. Studies on postural alterations particularly stress the direct relation between cerebrospinal fluid and venous pressure. Under ordinary physiological conditions, the venous pressure may be considered the chief factor in affecting the cerebrospinal fluid pressure. It is only under unusual conditions, such as severe metabolic disturbances, or under such conditions set up by injections of hypotonic or hypertonic solutions, that osmosis plays an important role in changing cerebrospinal fluid pressure.

(2) The cerebral blood flow is related to two important factors (a) the arterial pressure and (b) the caliber of the cerebral vessels. Thus, a rise in general arterial pressure results in an increase in cerebral blood flow, unless there is an associated compensating cerebral vasoconstriction. Again, cerebral vasodilatation is followed by an increased blood flow through the brain unless there is an accompanying marked fall in arterial pressure.

(3) During change in posture from the horizontal to the upright, there is a fall in carotid pressure which is kept within normal limits, probably mainly by the vasomotor system. Associated with this fall in pressure, there is a diminished cerebral blood flow and a greater uptake of oxygen per unit of blood by the brain, as compared with those maintained in the horizontal position.

(4) In individuals who have unstable vasomotor mechanisms or arteriosclerosis, the assumption of the upright position may throw an overwhelming burden on the cerebral circulation, so that the carotid pressure and cerebral blood flow fall abnormally. As a result, there is a relative cerebral anoxemia with the production of cerebral symptoms, reaching their acme in syncope or convulsions. The administration of vasodilator drugs when combined with upright tilting in normal persons may produce similar phenomena.

(5) The response of the cerebral circulation to the administration of drugs depends upon the complex pressure flow relation between the cerebral and general circulations. Probably the drug used in this study that was most dramatic in its effect was insulin. Moderate to large doses of insulin not only deplete the sugar in the blood, but may also produce a relative cerebral anoxemia, which probably explains the neurological symptoms in insulin hypoglycemia. That a relative cerebral anoxemia occurs during insulin hypoglycemia is indicated by the fact that although the blood flow through the brain tends to be diminished, there is a diminution in oxygen uptake by the brain as measured by the carotid jugular difference in oxygen.

Von Storch,²⁶ in a study of craniovertebral dynamics, has made observations regarding some phases of the normal dynamics of the craniovertebral cavity which are similar to those of Loman and Myerson, and has also commented on the technic of encephalography. He states that replacement of cerebrospinal fluid by syringe through a single lumbar puncture produces alternate elevation and depression of the fluid pressure. Simultaneous replacement of fluid prevents these alternations and minimizes the patient's unfavorable reactions. When the fluid has been completely replaced by gas, the ventriculosubarachnoid space is a gas-filled system in which pressures at all points are equal, irrespective of position. The lumbar subarachnoid pressure in such a system therefore remains the same whether the patient be sitting or recumbent, and consequently the intracranial pressures remain unchanged. The production of a final lumbar subarachnoid pressure, after complete replacement of cerebrospinal fluid by a gas, which approximates the normal lumbar cerebrospinal fluid pressure for that patient when recumbent, is not dangerous. It results in excellent roentgenograms under normal pressure-volume relation, and does not increase the patient's reaction. It is possible to introduce a volume of air at room temperature greater than the volume of cerebrospinal fluid removed without significantly increasing the intracranial pressure. The introduction of a volume of air greater than the volume of fluid it replaces increases the reliability of the roentgenograms. Subsequent to encephalography, after the manner outlined, the cerebrospinal fluid pressure is not increased above its normal value. Von Storch further points out that alternate replacement of cerebrospinal fluid by a gas through a single aperture very probably produces alternate vasoconstriction and vasodilatation of the cerebral vascular bed with hyperemia, edema, hemorrhage and severe reactions. Furthermore, the reactions subsequent to encephalography are not due to increased intracranial pressure but quite likely to shock and meningeal irritation.

areas, because of the rotation in the position of the brain produced by the blow and maintained by the adhesion. Two methods for injecting air, which reaches the subarachnoid and finally the subdural space about the involved area, are described. The technic is so devised that little or no air enters the ventricles. If sufficient air is injected, the brain, which is shrunk because of the collapse of the ventricles, pulls away from the overlying dural covering, with considerable traction due to its own weight. Of 25 cases so treated, 60 per cent were completely cured.

VASCULAR CONDITIONS

Intracranial Aneurysms

In a study of 31 cases of intracranial aneurysms Robertson³⁹ observed that the onset occurred under varying conditions, sometimes during exertion, sometimes during sleep. The ages ranged from sixteen to fifty-five. Fourteen patients survived. In some cases death occurred within twenty-four hours. Of the aneurysms definitely located at autopsy, 6 were on the middle cerebral artery, 3 near its origin and 3 near the lateral sinus, 3 were at the junction of the anterior communicating and the anterior cerebral arteries, and 2 somewhat more peripherally on the anterior cerebral artery. Aneurysms are sometimes multiple. They are more prone to develop in cerebral than in systemic vessels because the former are larger and thin-walled and bear high pressure, they are poorly supported, sometimes the paired vessel in the circle of Willis is aplastic, subjecting its fellow to greater strain. Their treatment is unsatisfactory.

The diagnosis is often difficult until rupture has occurred. Thorpe and Clegg⁴⁰ report a case in which autopsy revealed four aneurysms on the circle of Willis, which were of considerable size but had given no diagnostic symptoms during life.

In cases of aneurysm of the intracranial portion of the internal carotid artery, as shown in a review of 29 cases from the literature and 8 cases observed by McKinney, Acree and Soltz,⁴¹ diagnosis can be made by x-ray from the following findings: (1) calcification, forming a curvilinear shadow, with the convexity superiorly placed and slightly to one side of the sella turcica, (2) unilateral erosion of the sella turcica, (3) enlargement of the sella turcica, (4) unilateral enlargement of the optic foramen and superior orbital fissure, (5) erosion of the margins of the carotid canal, and (6) displacement of the pineal gland. Clinically the syndrome consists of exophthalmos and a partial or complete involvement of the second, third, fourth and fifth cranial nerves on the side on which the aneurysm exists. The third and fifth cranial nerves are always involved, and the others commonly

Purpura Hemorrhagica with Intracranial Hemorrhage

According to Garvey and Stephens,⁴² the frequency of sudden and often fatal intracranial hemorrhage in patients with purpura hemorrhagica has been underestimated. Of 30 cases of purpura which they observed, 7 of the 10 deaths followed intracranial hemorrhage. The histories preceding the onset of the hemorrhage were not significant. Bleeding into the mucous membranes was a common feature; all had hematuria, tarry stools and retinal hemorrhages. In 5 cases, in which necropsy was done, subdural or subarachnoid hemorrhage associated with bleeding into the brain substance was found. The commonest type of bleeding into the central nervous system is capillary-ring hemorrhage (brain purpura). Clinically the hemorrhage is associated with sudden hemiplegia, signs of subarachnoid hemorrhage, or coma and convulsions. The prognosis is grave and the treatment unsatisfactory.

ENCEPHALITIS AND ENCEPHALOMYELOPATHIES

Sequelae of Encephalitis Lethargica

The difficulty of prognosing the outcome of encephalitis lethargica of childhood is clear from Healy's⁴³ study of numerous selected cases of this disease. Thus, there was no correlation found between the intensity of the acute manifestations and the sequelae, nor was there any necessary relation between the intellectual function and the severity of the illness at the time of onset. Healy's study also substantiates the conclusions reached by others to the effect that damage to the central nervous system frequently continues long after the acute manifestations of the disease have disappeared. Because of this, "chronic encephalitis" would be more accurate than "postencephalitic sequelae."

Paroxysmal vegetative symptoms occurring as postencephalitic sequelae have been observed in 2 cases by Borremans and van Bogaert.⁴⁴ The attacks included vasodilatation with generalized sweating, tachycardia, often irregular, tachypnea or arrhythmic respiration, more or less periodic, hyperthermia, insatiable hunger and thirst, and increased abdominal peristalsis, even to involuntary evacuation.

Involvement of the Nervous System Associated with Influenza

In the course of epidemics of influenza, Laszlo and Nowotny⁴⁵ observed many cases showing mild involvement of the nervous system. While some patients developed a complete picture of Economo's encephalitis, the spinal cord and its meninges were principally involved, the lower extremities suffer-

skulls These deposits symmetrically involve the inner table of the bones or the diploe, usually in the frontal area, although the skulls are generally thickened The condition causes a symptom-complex which is as characteristic as the skiagraphy The symptoms consist of a more or less constant combination of headache, obesity or a tendency to obesity, muscular weakness and fatigability, nervousness, a tendency toward worry or depression, dimness of vision, epileptiform seizures, mental slowness to dementia, dizziness and disturbances of equilibrium and gait Sometimes there is impairment of the seventh nerve, difficulty in speech, loss of the sense of smell, dragging of an extremity and hirsutism in women Ninety-eight per cent of the author's cases occurred in women The condition does not coincide with any of the groups of osseous dystrophies, and does not appear to form part of any endocrinal disease It is a metabolic disease, in which the fat and calcium metabolism alone are at fault

Carr³⁴ studied 17 patients with varying degrees of hyperostosis of the inner table of the frontal bones, causing symptoms similar to those found by Moore Because of the high frequency of the obesity and the increase in dextrose tolerance, the author believes that many of the symptoms are metabolic in origin

TRAUMA TO THE BRAIN

Mental Sequelae Following Head Injury in Children

Very little is found in the literature regarding mental sequelae following head trauma in children Blau³⁵ gives the histories of 22 children with mental disorders following head injury Among these were 6 cases of acute psychosis, 4 of these showed bloody spinal fluid and no neurologic signs except for meningeal irritation The symptoms included acute excitement, marked impulsiveness and restlessness, complete lack of restraint, irritability and fear In 5 cases the psychosis lasted from fourteen to thirty-five days Follow-up histories obtained in 4 cases, ranging from six months to four years, failed to show significant sequelae Twelve cases in Blau's group showed chronic behavior disorder overactivity, restlessness, destructiveness, assaultiveness, cruelty to animals, emotional excitability, temper tantrums, truancy and delinquency The prognosis in most cases was poor No signs of focal disease of the central nervous system were evident Post-traumatic epilepsy occurred in 5 children The acute and chronic disorders differed only in degree and duration The syndrome is undoubtedly based upon pathologic changes in the brain, probably of a diffuse type

Brain Trauma in the Newborn

Despite the popular belief that asphyxia is frequently the cause of death in newborn children in cases of prolonged delivery, Heidler³⁶ holds that cranial injury is the primary cause Autopsies on 76 birth injuries showed hemorrhage in the subdural spaces, in the leptomeninges and ventricles, and intracerebrally In some cases tentorial tears and rupture of the pial vessels were found Asphyxia is secondary to such brain injury, according to Heidler To prevent these deaths, the author urges a shortening of the final stage of labor

Therapy of Head Injury

In discussing the treatment of intracranial injuries, Dandy³⁷ gives the following suggestions After the injury the patient should be put to bed immediately, and should not be subjected to x-ray or lumbar puncture, since these procedures are not necessary for diagnosis More important is careful observation of coma or restlessness Coma indicates increased intracranial pressure if it deepens, the pressure is increasing, if it lessens, the pressure is being compensated Restlessness shows that compensation is inadequate Morphine should never be administered Irregularity in the pulse rate and volume and a steady increase are both danger signs Dandy believes that hypertonic solutions are unsatisfactory, since they have only a temporary effect and are injurious to the brain Lumbar puncture, he feels, is also useless and results in later increase in pressure beyond the original level The only acceptable treatment, according to him, is surgery Operation is indicated at the point of breaking compensation or just beyond it Small openings in the parietal region on the suspected side are made if localized signs are present If fluid is not found, similar openings are made on the opposite side If there is no relief of pressure, subtemporal decompression is done Subdural hematoma, which develops later, is diagnosed by ventriculography Extradural hematoma, with coma developing after a free period and convulsions spreading from the face to the arm and leg, is treated by removing the hematoma and tying off the branches of the torn meningeal artery

Penfield and Norcross³⁸ describe the pathology of post-traumatic headache, and outline a special technic by which this condition is surgically relieved The authors state that the pathological basis of true post-traumatic meningeal headache consists in an intimate adhesion of the arachnoid to the dura, which causes obliteration of the dural space in a smaller or larger area The sensitive area, which is likely to be affected by this adhesion, is usually a meningeal artery in the dura, and less frequently a dural sinus Chronic pain results from pressure or traction on one of these sensitive

as generalized weakness and absence of reflexes. Such symptoms may be due to involvement of the nerves by the trichinae or a toxin elaborated by them. Dermatomyositis or periarteritis may also have to be considered in the differential diagnosis. In those cases of trichiniasis in which only the signs of polyneuritis are present, the prognosis is good. When mental symptoms or signs of focal lesions in the central nervous system are present the outlook is much more serious.

NEUROSYPHILIS

Etiology and Therapy

According to statistical reports made by Moore and Merritt,⁵² syphilis of the nervous system was considered the cause of mental disease in 9.3 per cent of the total number of cases admitted to the Boston Psychopathic Hospital from 1912 to 1934. Menninger,⁵³ in a comprehensive study of the literature on the subject of juvenile paresis, concludes that this type of syphilis occurred in less than 2 per cent of all cases of paresis and in about 1 per cent of congenital syphilis. The onset occurred in most cases around the fourteenth year in girls and around the fifteenth year in boys. Therapy in juvenile paresis is very disappointing when compared with the results obtained in adult cases.

Kemp and Menninger,⁵⁴ in an attempt to correlate the treatment of early syphilis and the incidence of neurosyphilis, studied 680 cases in a large syphilitic clinic. This study showed that of 253 patients who had received no treatment, 52.6 per cent had neurosyphilis, of 226 who received early inadequate treatment, 43.4 per cent had it, and of 201 who received adequate treatment, 16.9 per cent had it. Kemp and Menninger also found that patients inadequately treated showed a six-year reduction of the incubation period of clinical neuroles when compared with a group receiving no treatment.

Epstein, Solomon and Kopp⁵⁵ found, in a review of the literature of the results of therapy of general paresis with fever produced by diathermy and related mechanical modes of hyperpyrexia, that of 648 cases reported between 1929 and 1935, good remissions were observed in 27 per cent. Of 33 patients treated by the authors with diathermy between 1931 and 1934, 8 were improved and working, and 7 were improved but not working. Four patients, while remaining hospitalized, were known to be improved, 4 patients were living but unimproved, and 10 had died. There appeared to be a correlation between the clinical status and the reaction of the spinal fluid.

Solomon and Epstein⁵⁶ also present a series of 21 cases—19 of paresis and 2 of congenital neurosyphilis—treated over a continuous period of time by tryparsamide and subsequently given fever. These cases had previously shown unsatisfactory

responses to tryparsamide alone. All these patients responded satisfactorily both clinically and serologically to the fever therapy. The authors believe that preliminary tryparsamide injections greatly enhance the possibility of therapeutic success in the treatment of general paresis by fever, and that the improvement of the spinal fluid findings occurs sooner after fever if the patient has been prepared for the treatment with tryparsamide.

Barnacle, Ebaugh and Ewalt⁵⁷ treated one series of 30 paretics with diathermy and tryparsamide, and an equal-sized group with malaria and tryparsamide. There was no essential difference in the beneficial results, for 70 per cent and 63.6 per cent, respectively, showed improvement. There was no correlation between serologic reaction and clinical improvement.

Good results with malaria treatment are reported by Hutchings,⁵⁸ who used this type of therapy for ten years. Of 182 male paretics, 66 were much improved. Tabetics showed less encouraging results. Patients with psychoses of less than one year's duration presented the best outlook.

Cranial and Peripheral Nerves

Carotid-Sinus Nerve Involvement

The carotid-sinus nerve, a branch of the glossopharyngeal, is a depressor nerve, section of which is apt to be followed by a temporary rise in blood pressure. Bucy⁵⁹ reports 5 cases in which it was necessary to expose and section the glossopharyngeal nerve. Following the operation in 3 cases there was a sharp rise in blood pressure, which became normal within a few days. In 1 case the blood pressure rose markedly after sectioning and remained at the higher level during hospitalization.

Syncope and convulsions due to hyperactive carotid-sinus reflex have been observed by Weiss, Capps, Ferris and Munro⁶⁰ in 52 patients. The treatment of the abnormal reflex is directed toward the correction of all associated abnormalities. The administration of digitalis should be carefully watched, since it sensitizes the sinus reflex mechanism. One patient was relieved by treatment of a tuberculous gland, 1 by antiluetic treatment, 2 by correcting food deficiency and 4 by diminishing the dose of digitalis. Of 10 patients who were treated by surgical denervation within the previous two years, 8 remained free from attacks and 2 had a recurrence of symptoms.

Neuralgia

Harris⁶¹ reports that of 856 cases of tic douloureux 39 were bilateral. Of 41 patients with spastic paraplegia 7 had bilateral tics. The author believes that alcoholic injection is satisfactory for bilateral tic, even if it is necessary to perform both the injections at one sitting. If jaw droop results, re-

ing the brunt of the attack. All cases presented more or less developed symptoms of meningo-myelitis with a protracted duration. Some cases showed flaccid paraparesis and others only a slight decrease of power with pyramidal signs. Transient signs of meningeal irritation and neuritic irritation were also noted.

Mumps and Encephalomyelitis

Inflammation of the brain and the meninges in the course of mumps may be very marked, as observed by Jasinski.⁴⁰ In 1 case the meningeal symptoms were pronounced and were associated with high fever, intense headache and vomiting. The pathologic picture was that of a serous meningitis. Lumbar puncture showed a marked increase in pressure, clear sterile fluid and a high lymphocytic count—from 85 to 100 per cent. The course of the disease is stormy and short, and recovery is usual. In other cases of mumps the symptoms suggest encephalitis with involvement of the meninges.

Multiple Sclerosis

The various theories of the pathogenesis of multiple sclerosis are discussed by Brickner.⁴¹ Experimental lesions similar to those seen in the brain in this disease have been produced in animals by Ferraro, who injected small doses of potassium cyanide, and by Putnam, who used tetanus toxin, carbon monoxide and cod liver oil. Putnam believes that the resulting patchy demyelination is due to the production of venous emboli and thrombi. Rivers and Schwentker produced similar lesions by repeated intramuscular injections of alcohol extracts of brain lipoids. Brickner himself attempted to find as a cause of multiple sclerosis a lipolytic agent which might affect myelin. He found that in active phases of multiple sclerosis the degree of blood-serum esterase activity was low, whereas during inactivity it was high.

Putnam⁴² believes that the venular thromboses found in multiple sclerosis are primary and not secondary changes in the nerve tissue, and may be due to some fundamental disorder of the blood which results in clot formation in the cerebral vessels. He suggests that it may be possible to formulate a therapeutic program by lowering the level of fibrinogen by diet, by causing a decrease of platelets, or by administering an anticoagulant drug.

Nervous and Mental Sequelae in Carbon-Monoxide Poisoning

Shillito, Drinker and Shaughnessy¹⁹ have collected records covering the accidents from carbon monoxide in the metropolitan area of New York City for ten years. During this period 21,000 exposures to the gas were recorded. A search of New

York City institutions disclosed that only 42 case histories showed mental and nervous sequelae. From the histories it was evident that deep intoxication preceded all aftereffects. Artificial respiration and inhalations of oxygen and carbon dioxide had to be resorted to during treatment. Subsequent clinical manifestations were headache, dizziness, gastric distress and nausea due to cerebral edema induced by the poisonous gas. Temporary psychoses were the most frequent aftereffects of carbon-monoxide poisoning, common manifestations being confusion and loss of memory. Improvement within a few months was noted. Most of the psychotic patients were sufficiently improved in a year so that they could be paroled home. The more permanent neurologic lesions included 9 cases of muscular hypertonia (increased reflexes, ankle clonus and Babinski), 5 cases of hypertonia and some degree of peripheral neuritis (2 permanent), 4 cases of Parkinsonism (3 permanent), 1 case of Parkinsonism and some degree of peripheral neuritis, and 10 cases of peripheral neuritis. Ten deaths occurred before a complete neurological examination could be made.

Encephalopathy Following Extensive Burns

Only a few observers have been able to demonstrate involvement of the nervous system secondary to burns. Globus and Bender⁵⁰ report a case of an eight-year-old boy who received extensive second degree burns. He recovered from the shock but showed increasing evidence of toxicity. The neurological examination was negative, but the patient developed an abnormal mental state, first refusing food and defecating and voiding in bed, later he became abusive to the nurses, expressed deep resentment against his parents, and gradually became unresponsive, withdrawn and subject to attacks of deep anxiety. He often expressed a desire to die. It is interesting to note that for a time psychiatrists who examined the patient thought that his mental state was due to psychic trauma caused by the accident which had led to regression to an infantile level. A short time later the patient rapidly became emaciated, and he died about six months after admission. The brain showed many changes resembling those of multiple sclerosis. It is probable that they were caused by a toxic agent formed in the disintegrating, burned tissues.

Involvement of the Nervous System in Trichiniasis

Merritt and Rosenbaum⁵¹ report 2 cases of trichiniasis in which there were neurologic complications. The authors point out the difficulty of diagnosis. When trichiniasis involves the nervous system it may simulate polyneuritis, acute poliomyelitis, encephalomyelitis or, rarely, meningitis, although the spinal fluid is usually normal. It is difficult to explain the signs of polyneuritis, such

of vascular disease, primarily arteriosclerosis, was present in a large percentage of the cases, arteriosclerosis, however, may be the result of the diabetic factor rather than the cause of the neuropathy. Deficient dietary intake seemed of no significance, as judged by the dietary histories and the result of feeding accessory food substances. Marked improvement in symptoms and signs occurred within a few weeks in many cases, and within a few months in most.

Jolliffe, Colbert and Joffe⁶⁸ present data which tend to confirm the hypothesis that alcohol neuritis is caused by avitaminosis. The authors made a survey of 26 alcoholics with neuritis and 16 alcoholics without it. They employed Cowgill's formula which expresses the vitamin-B need as the quotient obtained by dividing the vitamin-B equivalent expressed in milligrams by the total caloric intake. Normally this ratio should be about 2. It was found that the vitamin intake was inadequate in most of the 26 patients with neuritis, but was adequate in most of the 16 without neuritis.

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covery will take place because the motor roots will regenerate

Horrax and Poppen⁶² give the differential features of neuralgia affecting the head. Postherpetic neuralgia usually shows scars of herpetic vesicles involving the trigeminal nerve, and usually clears up in several weeks. The pain is not controlled by alcohol injection or posterior root section. In Sluder's or sphenopalatine neuralgia the pain is usually at the base of the nose, upper jaw and eye, radiating back to the ear and mastoid regions, and extending at times to the back of the neck, shoulder and upper extremity. Neuralgia due to involvement of the geniculate ganglion involves the sensory portion of the seventh cranial nerve, causing severe otalgia. Glossopharyngeal neuralgia involves the tonsils, pharynx and posterior part of the tongue. Pains due to sympathetic involvement are usually dull, aching, burning or elicited by pressure, and seldom follow the anatomic distribution of nerves. In mild cases of trigeminal neuralgia, inhalations of trichlorethylene are advised. Of 90 patients, nearly a half had sufficient relief so that they required no other form of therapy for as long as from six months to six years. If no relief is obtained by this treatment, alcohol injections are given. This measure is not only of therapeutic value but serves as a diagnostic test. Of 600 cases where injections were performed by the authors, the average period of relief was 14.3 months. Sensory-root operation is advised only if alcohol injection fails to give relief. It was performed on 176 patients without a single fatality, keratitis developed in 9 patients and temporary facial palsy in 6.

Treatment of Facial Paralysis

For cases of facial palsy that is complete and permanent, Davis and Cleveland⁶³ discuss two methods of surgical treatment: (1) an attempt to repair the atonic musculature by transplantation of fascia, (2) an attempt to effect an end-to-end anastomosis, or, when this is impossible because of scar and callus formation, suturing the distal end of the facial nerve and the central end of another nerve. Of the latter method, the most successful anastomosis was obtained with the hypoglossal nerve. Muscle tone and symmetry of the face quickly returned. Facial movements were at first associated with tongue movements, but after two years the patients were able to dissociate the two. Postoperative treatment consisting of mechanical devices, electrotherapy and educative exercises is also advised.

Bertola, Yadarola and Sala⁶⁴ recommend the operation of Leriche for facial palsy not amenable to conservative treatment. This consists of resection of the superior cervical ganglion, resulting in paralysis of Müller's muscle so that drooping of the eyelid occurs. Associated with the ptosis of the lid

there are enophthalmos and miosis, vasomotor symptoms and abundant salivation. Many of the symptoms gradually disappear. The tonus of the cheek improves and the nasolabial fold recovers practically its normal form. Excellent results in 3 cases are described.

Postoperative Neurologic Complications

The many neurologic conditions which may occur during convalescence from an operation are discussed by Woltman⁶⁵. The peripheral nerve disorders include neuritis of the ulnar nerve due to pressure of the arm on the operating table, peroneal palsy due to pressure on the underlying mattress or crossing of the legs, and brachial palsy in women, which may follow pelvic operation or be caused by poorly padded shoulder rests, asymptomatic cervical ribs or faulty posture during narcosis. Certain cranial nerves may be involved, notably the sixth, less often the third and fourth. The cause of the latter involvement is unknown. Before deciding on surgery the presence of deficiencies should be determined, otherwise, pathologic conditions may be precipitated. The author cites a case of a woman who since limiting her food intake because of a fecal fistula had developed combined system disease of the cord, death occurred three days after spinal anesthesia for resection of the sigmoid. Another patient after living on milk and eggs for six months developed Korsakoff's syndrome after gastroenterostomy. The various types of psychoses following operation are also discussed.

Dietary Deficiency as Etiologic Factors in Certain Neurologic Syndromes

In Perkins's⁶⁶ observation of 82 cases of neurologic conditions in which multiple neuritis was conspicuous and which included alcoholism, pernicious anemia, cancer of the intestinal tract, malnutrition and pregnancy, he found digestive disturbances constantly present. In every case a logical explanation for the lack of intake or failure of proper digestion or assimilation could be made. The varieties of clinical syndromes were very similar to those seen in such deficiency diseases as beri-beri, pellagra and sprue.

Neuritic Manifestations in Diabetes Mellitus

Jordan⁶⁷ presents findings in 120 cases of diabetes with relatively acute and usually severe neuropathy. Among 1000 consecutive cases of diabetes observed by the author, there were 25 cases of neuritis, which involved the legs in 16. Pain, paresthesia, hyporeflexia and areflexia, muscle paresis, tenderness of the nerves and muscle, hypesthesia and hyperesthesia were the most frequent manifestations. The spinal fluid contained excess protein. Hyperglycemia did not appear to be an essential factor in the production of the neuritis. Evidence

outline of the left kidney to be slightly larger than the right and low in position

On the sixth hospital day an operation was performed

DIFFERENTIAL DIAGNOSIS

DR. CHANNING C. SIMMONS There are one or two further points I should like to know. In the physical examination no mention is made of enlargement of the thyroid or parathyroid glands. I presume they were negative. I rather question one or two statements about the bones in the x-ray examination. May we look at the films to see if the other bones are normal? The diagnosis is one of five or six conditions: (1) inflammatory condition, (2) some form of metabolic disease, (3) one of the rare skeletal diseases, (4) primary bone tumor, (5) one of the other tumors sometimes primary in bone, such as malignant lymphoma or reticulum-cell sarcoma, (6) metastatic tumor.

The possible inflammatory conditions are tuberculosis, osteomyelitis and syphilis. I think we can rule out tuberculosis. Acute osteomyelitis in a man of his age is unusual. It is also unusual to have a Brodie's abscess without more thickening of the cortex, from irritation, above and below the cavity. Moreover his blood was normal except that the white-cell count showed 79 per cent polymorphonuclears, which is high, and the monocytes were high—12 per cent.

Syphilis always has to be borne in mind. The Hinton test was negative. The syphilologists tell me that 40 per cent of the cases of tertiary bone syphilis have negative Wassermann reactions. The Hinton is of course more sensitive but not infallible. Consequently, although it is negative, syphilis has to be considered.

Metabolic disease such as Paget's disease and parathyroid disease should be considered. I should say the bones were not normal. I do not know how Dr. Holmes feels about them. Is that the x-ray of a normal humerus?

DR. GEORGE W. HOLMES I think part of the appearance is due to the fact that the film was not taken in the usual position.

DR. SIMMONS Is that not a thick bone?

DR. HOLMES Yes it is, and is somewhat suggestive of Paget's or syphilis.

DR. SIMMONS Is the appearance due to position?

DR. HOLMES I should not say that the femurs were abnormal. In this region you have a thickening of the cortex which does not indicate disease. You might get such an appearance with an old fracture. I think you can rule out an inflammatory condition.

DR. SIMMONS As regards Paget's and parathyroid disease, the blood chemistry seems to be normal. If it were Paget's disease one would expect a higher phosphatase, 4.28 units is practically normal according to the Bodansky method. One would expect it to be 8 or 10 in Paget's disease.

I think we can rule out the rare skeletal diseases. They are certainly not suggested by the x-rays.

We come down to primary bone tumor, metastatic tumor, reticulum-cell sarcoma and lymphoma. Primary bone tumor in a man of forty-three is unusual, except Ewing's sarcoma which does not originate in this situation. It is a bone-destructive tumor and is usually not situated in the center of the shaft of the bone. One has also to consider giant-cell tumor, giant-cell tumors arise at the end of the bone, not in the center, and are clear cut where they join the shaft. They expand rather than destroy the cortex. We then come to reticulum-cell sarcoma and lymphoma. The x-ray does not suggest lymphoma. Reticulum-cell sarcoma appears by x-ray as a mottling of the medulla or as a bulky tumor with bone destruction, and the films do not suggest this type.

Any malignant tumor may give bone metastases although they occur much more commonly with cancer of the thyroid or breast and with hypernephroma. This man has a tumor connected with his left kidney which apparently has given no symptoms so far as the urinary tract is concerned. He has never passed blood, and this is suggestive of hypernephroma situated at the top of the kidney. A tumor so placed does not involve the calices and therefore does not give any blood in the urine. My feeling would be that we have a metastatic tumor of the tibia, the probable origin of which is a tumor of the kidney, a hypernephroma. The x-ray is our best single method of diagnosing bone tumor but not the last word.

DR. TRACY B. MALLORY Have you anything further to add, Dr. Holmes?

DR. HOLMES I should like to confirm the statements Dr. Simmons has made. It is true when you come to look at all the bones in this patient that he has rather heavy, short bones, and it is also true that they were not adequately described in the text. Thickening in the cortex of bones, as seen in the left tibia, always makes one suspect syphilis, but this particular lesion is localized and can better be explained on the basis of an old fracture. When we come to the lesion in the shaft, it is a purely destructive process with no attempt at new bone formation. For that reason I should agree with Dr. Simmons that it is metastatic and not a primary tumor. Its location and the character of the lesion itself point to a metastatic process. In re-

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24101

PRESENTATION OF CASE

A forty-three-year-old Italian shoemaker was admitted complaining of a tender swelling on the right leg.

The patient had been well until three months before entry when he first noted a small tender area on the medial aspect of the right tibia. The sensation was "burning" in character and the leg ached after walking. There had been no injury to this region, nor were there any other associated symptoms. The local application of various self-administered medications produced no relief. Six days before coming to the hospital the pain increased in severity, and slight swelling was noted in the area involved. There were no other significant symptoms. His weight had been stationary for three years.

The past history was noncontributory.

Physical examination showed a well-developed and nourished man in no evident discomfort. Examination of the head and neck was negative except for a pea-sized, firm, non-tender node in the right cervical region. The lungs were clear. The heart was normal. The blood pressure was 150 systolic, 100 diastolic. The abdomen was soft, and there were no areas of tenderness. A mass was felt in the left upper quadrant which extended two fingerbreadths beneath the costal margin. No notch was felt, but the edge was sharp. A rectal examination was negative. At the juncture of the middle and upper thirds of the posterior portion of the medial surface of the right tibia there was an area of roughening of the bone about 2.5 cm in diameter. The skin in this region was warm and slightly reddened, and pressure over it produced pain. The remainder of the examination was negative.

The temperature, pulse and respirations were normal.

Examination of the urine was negative. No Bence-Jones protein was found. The blood showed a red-cell count of 6,700,000 with 86 per cent hemoglobin. The white-cell count was 8800, 79 per cent polymorphonuclears, 8 lymphocytes, 12 monocytes, and 1 eosinophils. The serum calcium was 9.52 mg per cent, the phosphorus 5.08 mg per cent,

and the phosphatase 4.28 Bodansky units. A blood Hinton test was negative.

An x-ray showed an ovoid area of bone destruction within the middle portion of the shaft of the right tibia (Fig 1). The lesion lay within the



Figure 1 X-ray photograph of midportions of the right tibia and fibula

marrow but involved the central portion of the cortex. The area was fairly well outlined, and there was no evidence of newbone formation or periosteal reaction. No soft-tissue mass was seen. There was a fusiform thickening of the cortex of the left tibia at the middle third of the bone. The lesion was in no way related to the lesion on the right and might have been the result of an old fracture. An x-ray of the chest showed the heart to be transverse in position, slightly enlarged, and there was calcification of the aortic knob. The lung fields were clear. An abdominal film demonstrated calcification of the pelvic arteries. The other bones exhibited no variation from the normal. The left kidney was slightly larger than the right and appeared to be displaced downward. A retrograde pyelogram showed the kidney outlines on the right side to be normal in size and position. Both psoas outlines were well visualized. The left kidney pelvis lay at the level of the third lumbar vertebra and appeared to be displaced somewhat laterally. The minor calices were well defined. The course of the left ureter was directly to the right of the lower border of the second lumbar vertebra at which point it turned sharply downward and followed its usual course. No calculi were seen. Another film showed the

was not in the kidney. As you can see from the photograph (Fig 2), which was taken after the specimen had been dissected, the tumor lay medial to and slightly above the kidney and though closely attached to it could readily be separated from it. When the sections of the primary tumor were available it was evident that it was a primary carcinoma of the adrenal. The subsequent course of the patient was a little stormy. He developed intestinal obstruction in the jejunum in the region from which the tumor had been resected, so it proved necessary to resect about 60 cm of the jejunum. He survived that and is symptom free now, just a year later.

CASE 24102

PRESENTATION OF CASE

A forty-four-year-old white Canadian lumberman entered the hospital with the complaint of progressive blindness of fourteen months' duration. Fourteen months before entry while working in the woods he suddenly developed almost total blindness. However, in about fifteen minutes his vision cleared so that he could continue his work, but he still had difficulty in seeing. Twelve months before entry the entire right side of his body suddenly became numb. He felt dizzy and fell to the ground. He felt faint but did not lose consciousness. For about ten minutes he was unable to get up and after that could not continue his work because of severe occipital headache. For the subsequent two or three days the muscles of the right side of his body were very sore. The headache disappeared but recurred for brief intervals whenever he lifted heavy objects. For the next six months whenever he looked upward he saw 25 or 30 blue balls, like bunches of grapes, and had a sensation that the "earth was going over backwards." This sensation stopped as soon as he looked down. Six months before entry his left eye became totally blind and gradually the vision of his right eye became more and more impaired until he could see only out of the nasal side of it. He also began to have severe temporal headaches lasting twenty-four hours, and the movements of his legs became clumsy and unsteady. He had no auditory, olfactory, or other cranial-nerve symptoms, and he was able to continue his work up to a short time before entry. There was no memory loss or change in habits.

He had been married for twelve years and had seven children living and well. One had died of pneumonia and three had died in infancy. He said he had had all the childhood diseases except scarlet fever and diphtheria. Twenty years before entry he had been struck by a derrick arm

on the left side of the face and knocked unconscious, but had had no cerebral symptoms following the incident. He denied venereal disease, and had had no neuromuscular symptoms except those given above.

Physical examination revealed a well-developed and nourished man in no apparent discomfort. There was slight tenderness over the right mastoid and over the occipital protuberance. His heart, lungs and abdomen were negative, and his blood pressure was 110 systolic, 68 diastolic. The right side of his face was covered with drops of perspiration, but the left side was warm and dry. The left eye was totally blind, and there was complete temporal hemianopsia of the right eye. The fundi were normal, and the disks were slightly pale. There was slight cloudiness of the left cornea. The right pupil reacted sluggishly to light and accommodation, and the left pupil showed only consensual light and accommodation reflexes. There was no diplopia, squint or nystagmus, and the cranial nerves were otherwise negative. The vibratory sense and the motor and sensory systems were normal. There was a positive Romberg and a slightly unsteady gait, but no rebound phenomena. Position sense was normal, and the finger-to-nose and heel-to-knee tests showed no incoordination. Stereognosis was normal. The reflexes were entirely negative.

The temperature was 98.6°F., the pulse 50. The respirations were normal.

The urine examination was negative. The blood showed a red-cell count of 5,250,000 with 95 per cent hemoglobin, and a white-cell count of 12,100 with 76 per cent polymorphonuclears. A lumbar puncture showed an initial pressure of 100 with normal dynamics. The fluid was clear and colorless, contained no cells, and showed a total protein of 56 mg and a sugar of 66 mg per cent. The goldsol curve was 0001221100, and the spinal fluid Wassermann was negative.

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On the evening of the fifth day after entry he called the nurse and said there was something the matter with him. Immediately afterward he became stiff, pushed his right leg and arm out from under the bedcovers, and began to have rapid, violent clonic convulsions of the whole right side of his body accompanied by fine convulsions of the

gard to the kidney, any lesion which displaces the kidney and its pelvis downward, as this does, in all probability is either in the kidney itself or retroperitoneal, very close to it. Lesions in the abdomen do not displace the kidney downward. I think it is perfectly safe to say that the mass causing the displacement is part of the kidney or in some way connected with it. Tumors of the cortex of the kidney as a rule involve the pelvis. They cause some distortion of the pelvis—more distortion than is seen in this case. But you can have a considerable tumor without distortion of the pelvis. A tumor large enough to displace the kidney downward should give evidence of involvement of the pelvis. The character of the lesion in the bone is quite typical of metastasis from a kidney tumor.

DR MALLORY: Have you any comment, Dr Smith?

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DR SIMMONS'S DIAGNOSIS

Metastatic tumor, probably hypernephroma

ANATOMICAL DIAGNOSIS

Carcinoma of the adrenal

PATHOLOGICAL DISCUSSION

DR MALLORY: The lesion of the bone was biopsied, and a small amount of material curetted out. In the sections we found an epithelial tumor composed of fairly large cells, with prominent cell membranes and very light semivacuolated cyto-



Figure 2 Left kidney with adherent tumor of the adrenal

plasm. The appearance was so close to that of hypernephroma that I had no hesitation in making a flat-footed diagnosis of metastatic hypernephroma. That seemed to settle the differential diagnosis, and it was decided since there seemed to be a single metastasis it was worth while to go ahead and remove the primary tumor. It was done through an anterior approach by Dr Allen, who found a very large tumor lying above and closely attached to the kidney. He did not attempt to discover whether it was in the kidney but removed the tumor and kidney together. The tumor was very adherent to the jejunum and was separated with a great deal of difficulty. When the tumor was finally removed and examined it was clear that it

was not in the kidney. As you can see from the photograph (Fig. 2), which was taken after the specimen had been dissected, the tumor lay medial to and slightly above the kidney and though closely attached to it could readily be separated from it. When the sections of the primary tumor were available it was evident that it was a primary carcinoma of the adrenal. The subsequent course of the patient was a little stormy. He developed intestinal obstruction in the jejunum in the region from which the tumor had been resected, so it proved necessary to resect about 60 cm. of the jejunum. He survived that and is symptom free now, just a year later.

CASE 24102

PRESENTATION OF CASE

A forty-four-year-old white Canadian lumberman entered the hospital with the complaint of progressive blindness of fourteen months' duration.

Fourteen months before entry while working in the woods he suddenly developed almost total blindness. However, in about fifteen minutes his vision cleared so that he could continue his work, but he still had difficulty in seeing. Twelve months before entry the entire right side of his body suddenly became numb. He felt dizzy and fell to the ground. He felt faint but did not lose consciousness. For about ten minutes he was unable to get up and after that could not continue his work because of severe occipital headache. For the subsequent two or three days the muscles of the right side of his body were very sore. The headache disappeared but recurred for brief intervals whenever he lifted heavy objects. For the next six months whenever he looked upward he saw 25 or 30 blue balls, like bunches of grapes, and had a sensation that the "earth was going over backwards." This sensation stopped as soon as he looked down. Six months before entry his left eye became totally blind and gradually the vision of his right eye became more and more impaired until he could see only out of the nasal side of it. He also began to have severe temporal headaches lasting twenty-four hours, and the movements of his legs became clumsy and unsteady. He had no auditory, olfactory, or other cranial-nerve symptoms, and he was able to continue his work up to a short time before entry. There was no memory loss or change in habits.

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Figure 2 Left kidney with adherent tumor of the adrenal.

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that localization can hardly be other than suprasellar, primarily on the left side. We have less evidence as to the type of lesion. The commoner lesion would be a suprasellar tumor with repeated hemorrhages, but I cannot recall seeing in the literature or noting in our own cases repeated exacerbations of symptoms with pressure on neighboring structures, as must be the case here, in such tumors whereas that does occur frequently in aneurysm. So in spite of the fact that it is a rarer condition in this region I should put first aneurysm with fatal rupture—a fairly good-sized aneurysm,—with suprasellar tumor, secondly,—one which has bled repeatedly,—and thirdly, a tumor of the pituitary which has outgrown the confines of the sella and has become suprasella in location.

DR. TRACY B. MALLORY: Dr. White, you saw this patient. Have you anything to say?

DR. JAMES C. WHITE: Our first admission diagnosis was suprasellar cyst, and it was not until we had evidence of blood in the ventricle that we began to feel that it must be aneurysm. Perhaps if Dr. Ayer had not known about that he would not have made it his first choice.

DR. AYER: The hemorrhage into the ventricle would not disturb me, but finding a sac of blood is unlikely in tumor and is characteristic of aneurysm. I still may be wrong.

DR. WHITE: He had headaches, which could be attributed to arachnoid bleeding.

DR. AYER: No evidence for or against that.

DR. WHITE: The other evidence was that as he chopped trees and watched the stump he could not see the axe until it got there.

DR. WILLIAM B. BREED: Would the absence of calcification by x-ray make you more certain that it was not suprasellar cyst?

DR. AYER: A good many of these tumors do not have calcification. If we did find it, I think it would be against aneurysm.

DR. BREED: I just wondered how high a percentage does show calcification?

DR. AYER: I should have that information at my tongue's tip but I cannot recall. A number do that is all I can say.

CLINICAL DIAGNOSIS

Suprasellar cyst with hemorrhage

DR. AYER'S DIAGNOSES

- 1 Aneurysm, suprasellar
- 2 Tumor, suprasellar

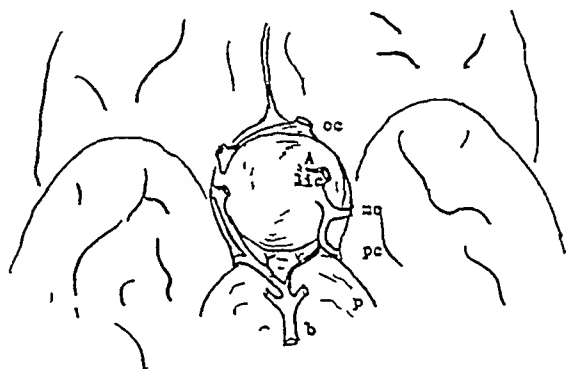
ANATOMICAL DIAGNOSIS

Aneurysm of the left internal carotid artery

PATHOLOGICAL DISCUSSION

DR. CHARLES S. KUBIK: This was a ruptured aneurysm, a very unusual one, both because of its large size and its position. It was right above the sella and originated from the left internal carotid artery.

There is not much more to be said about it. There was blood in the ventricles, as well as in the subarachnoid space. The diagram shows where the aneurysm was situated.



oc — optic chiasm pc — posterior cerebral artery
A — aneurysm p — pons
lic — left internal carotid b — basilar artery
mc — middle cerebral artery

DR. MALLORY: There was a terminal subarachnoid hemorrhage.

DR. AUBREY O. HAMPTON: What was the condition of the sella turcica?

DR. KUBIK: There was slight erosion.

DR. AYER: It was shown by x-ray.

DR. HENRY R. VIETS: There is no evidence that it was syphilitic?

DR. AYER: The tests were all negative. Most of these intracranial aneurysms are not syphilitic.

left side. He was unconscious, and his eyes were closed. For the next five minutes the convulsions continued intermittently, and he licked his lips continuously. Finally the convulsions ceased, and he regained consciousness although his body remained stiff. The blood pressure was 120 systolic, 80 diastolic, after the convulsions. The right pupil was dilated and reacted only very slightly to light. He said that he felt dizzy and faint, and that the right side of his body was numb. The ankle jerk and arm reflexes were more active on the right, the knee jerks were both very active and equal, the right plantar reflex was equivocal, the left was normal, and there was sustained clonus on the right and unsustained clonus on the left. The following morning he was found lying face down on the floor breathing heavily with his mouth open. His eyes were partially open, staring straight ahead, and his face expressionless. His body was tense, and his arms were shaking. He was incontinent of urine and when spoken to answered incoherently. His pulse was very slow, strong and somewhat intermittent, and his blood pressure was 150 systolic, 70 diastolic. He could not state definitely how long the attack had lasted, and he remained restless and irrational for about an hour. Late that afternoon he suddenly got out of bed, seemed very dazed, and made aimless movements with his hands. He resisted attempts to put him to bed and then suddenly became comatose with gasping respirations. A left ventricular puncture was done as soon as possible, and the ventricle was found to be full of fluid blood. His condition improved somewhat after this, and an attempt was made to decompress the suprasellar region through a burr hole in the left temporal area. A cyst-like wall was punctured in the region of the sella, and about 6 cc of partially clotted blood was removed. Several hours later a second ventricular tap was done without much improvement, and he died shortly thereafter.

DIFFERENTIAL DIAGNOSIS

DR JAMES B AYER. For localization of the lesion the eye symptoms are obviously of greatest importance. The first symptom of illness was sudden transitory blindness, followed by progressive loss of vision first in the left, then in the right eye. This course strongly suggests a lesion at or near the only place where the visual pathways meet, that is, the optic chiasm, and this supposition is made more certain by the examination which discloses pallor of both optic disks and absence of light response in the left pupil. Whether due to pressure from above the chiasm or from below, or to a disorder of the optic pathways, is not certain at first, but shortly after the initial eye symptoms, numbness of the entire right side of

the body and falling to the ground suggest disturbance of sensory and motor pathways, cephalad to the pons on the left side, and absence of unconsciousness seems to exclude cortex as the seat of this attack. Numbness, weakness and increase in reflexes, found later, can best be explained by pressure upon the left crus cerebri. These two groups of symptoms, the visual and the sensorimotor, appear to place the lesion above and to the left side of the optic chiasm. The development of epilepsy later can well be explained on the basis of further extension of pressure to the uncus of the temporal lobe, a favorite origin for convulsions.

I see no evidence to point to direct labyrinthine or cerebellar dysfunction to explain vertigo on looking upward or slight unsteadiness.

What is the pathologic lesion? The evidence is in favor of a progressive expanding lesion, with several sudden attacks causing sudden loss of function in the territory mentioned. As blood was found in the lateral ventricle following one of these attacks, it is reasonable to think of aneurysm or a vascular neoplasm which bleeds periodically causing the acute symptoms mentioned in the history. Death seems to have been due to bleeding into the third ventricle.

The principal tumors to be considered as causing the above chain of events comprise two groups. First, there are those arising in the pituitary body itself and subsequently expanding through the diaphragm of the sella to cause pressure on neighboring structures. The preservation of the sella, although somewhat enlarged and the lack of outstanding endocrine symptoms (although some acromegaly is suggested by x-ray) render such tumors unlikely, although not excluded. Suprasellar tumors form the second group. Of these, the meningioma arising from the sella turcica or sphenoidal ridge must be considered, but probably excluded because its enlargement would be very slow and is not usually accompanied by violent access of symptoms. Tumors arising from cell rests in the pituitary stalk satisfy the given clinical course, they are frequently cystic and highly vascular.

Aneurysms in this neighborhood, arising from the anterior cerebral or anterior communicating arteries, single or bilateral, may cause progressive blindness, and by repeated bleeding produce transitory pressure upon neighboring structures. One would expect an aneurysm to rupture into the subarachnoid space, but there is no reason why it should not rupture into the third ventricle. The finding of a cyst-like wall containing blood clot suggests aneurysm although not excluding tumor.

Putting the evidence together it seems to me

social and health organizations, the establishment of welfare-department responsibility for medical care of the indigent and near-indigent, and the broadening of the functions of the local hospitals. It was further recommended that a State Health Council be established, which would act as a coordinating unit for the district councils and would serve as a deliberative body for consideration of the broader aspects of the problems. In the report of another subcommittee, the chairman, Dr Channing Frothingham, declared that "the indigent sick in any community could be cared for by the individual physician through the proper authorities. Plans for the fulfillment of this principle are now in operation in Franklin County and in various townships in other counties."

Although this report has been published in full in the Proceedings of the Massachusetts Medical Society, reference to it seems to be appropriate at this time, in order to stimulate more interest in the propositions set forth and thereby induce the district societies to put the recommendations in effective operation.

In this connection it is of interest to refer to the editorial in the *Journal of the American Medical Association* of January 15, where it is recorded that the Executive Committee of the Board of Trustees of the American Medical Association has adopted resolutions which cover practically all the important recommendations made by the subcommittee of the Massachusetts Medical Society and referred to above.

FUROR SCRIBENDI

It should be axiomatic that investigative work done in and published from teaching centers that are recognized as authoritative be both instructive and convincing. Unfortunately it requires only a superficial perusal of any medical journal to demonstrate that, in this respect at least, axioms are not what they used to be. "Competitive investigation," "furor scribendi," the adulation of the general public for the individual who screams loudest in print, and the commensurate increase in his earning capacity, all lead to bigger but poorer journals. This is especially anachronistic in medicine since hon-

esty of thought as well as accuracy of observation lies at the very foundations of this particular science. It is also true that the fault, if it be one, of publishing ill-considered and what might be called anemic papers lies equally with the editorial boards of these journals. Their action can be explained, and to some extent excused, by the fact that they still think that they provide what their readers want, especially as the latter have given no sign to the contrary.

A recent example of this sin against Aesculapius has been provided by a solemnly expounded thesis which deals with and draws conclusions from the study of less than twenty instances of an annoying physiologic condition that may affect slightly less than fifty per cent of the millions of people who form the population of the United States. Even the authority resident in the imprimatur from what is admittedly one of the leading institutions of this country cannot justify failure to use experimentally a few more, at least, of the possible millions before rushing into print. The observations made and conclusions drawn are unquestionably accurate. The reasons for publication, however, are—to put it mildly—inadequate, and as a matter of charity must be laughed at rather than condemned. However, it does not really matter! The paper can still be used to light a fire which will, after all, warm those who can but will not write, at the expense of those who will but should not.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 62 SEPARATED PLACENTA AT TERM

Mrs M A, a thirty-nine-year-old multipara, was admitted to the hospital on January 13, 1932, because of bleeding, she was in labor and at term. The bleeding had begun two hours previously, was profuse and continued until admission. The pa-

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

The New England Journal of Medicine

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Established in 1828

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THE MASSACHUSETTS PROBLEM OF ADEQUATE MEDICAL CARE

FORTUNATELY for the people of this country there are, in professional groups and among sociologists and philanthropists, men and women with vision and mental poise who are earnestly striving to relieve the misfortunes found among the victims of maladjusted social environment and of disease. Of these groups the physician is recognized as an important factor in bringing to bear remedial measures.

A great variety of plans have been formulated and experiments carried on designed to ameliorate the predicaments of those who seem to be unable to work out for themselves the solution of the problems involved. The medical profession has become conscious of its responsibility in co-operating with other agencies in dealing with disease and the associated economic factors, and has af-

firmed its readiness to give the quality and degree of service that is indicated.

With these objects in view, organized medicine in this State has, through the Massachusetts Medical Society, pledged its best efforts to meet the medical needs of all the people. This sentiment was made manifest through the creation of the Committee on Public Relations several years ago, which was composed of representatives of the eighteen district medical societies. In order to deal with problems connected with adequate medical care a subcommittee was appointed consisting of Dr. Ernest L. Hunt, chairman, and Dr. Halbert G. Stetson and Dr. Patrick J. Sullivan with instructions to study the economic conditions relating to adequate medical care for the people of Massachusetts.

In order to secure available information relating to the subject, a survey of 500 Massachusetts families comprising 1820 individuals, covering the economic burden incident to ill-health and many other associated matters, was carried on. Two years were devoted to this task, and a report of the committee's findings was given to the Council of the Massachusetts Medical Society, June 8, 1936, with recommendations which were approved. The survey disclosed the facts that untreated and imperfectly treated cases of illness existed in Massachusetts and that inadequate financial resources of patients accounted for a considerable proportion of the poor medical care, with other important contributing conditions set forth in the sixteen explanatory divisions. This study is being continued, and in a recent paper presented to the Worcester District Medical Society, Dr. Hunt declared that in at least thirty per cent of the cases of illness in Massachusetts there is some inadequacy of medical care.

The remedial measures designed to meet the conditions set forth in the report of this committee consist, first, in the creation of health councils in each district-society area, whose functions would include the education of the people as to the needs and possibilities of medical service and measures for securing it, the provision of suitable clinics, the obtaining of co-operation from industrial, fraternal

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning March 14

BARNSTABLE

Sunday, March 20, at 4 00 p m., at the Cape Cod Hospital, Hyannis. Subject. Gonorrhea in the Male. Instructor Roger C. Graves John I B Vail, *Chairman*

BERKSHIRE

Thursday, March 17, at 4 30 p m., at the House of Mercy Hospital, Pittsfield. Subject Some Complications of Labor Analgesics in Labor Instructor Christopher J Duncan Melvin H Walker, Jr., *Chairman*

BRISTOL SOUTH (Fall River Section)

Monday, March 14, at 4 30 p m., at the Union Hospital, Fall River Subject Bleeding in the First Trimester of Pregnancy Instructor M. V Kappius. Howard P Sawyer and Robert H Goodwin, *Chairmen*

ESSEX NORTH

Friday, March 18, at 4 00 p m., at the Lawrence General Hospital, Lawrence. Subject Bleeding in the First Trimester of Pregnancy Instructor Judson A. Smith. John Parr, *Chairman*

FRANKLIN

Wednesday, March 16, at 8 00 p m., at the Franklin County Hospital, Greenfield. Subject The Use and Misuse of Prontylin. Instructor Benjamin W Carey, Jr Halbert G Stetson, *Chairman*

HAMPDEN

Thursday, March 17, at 4 00 p m., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8 00 p m., in the Outpatient Department of the Skinner Clinic, Holyoke Hospital, Holyoke. Subject Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor Sylvester McGinn. George D Henderson and George L. Schadt, *Chairmen*

HAMPSHIRE

Wednesday, March 16, at 4 15 p m., in the Nurses Home, Cooley Dickinson Hospital, Northampton. Subject Gonorrhea in the Male. Instructor Oscar F Cox, Jr Warren P Cordes, *Chairman*

MIDDLESEX EAST

Tuesday, March 15, at 4 00 p m., at the Melrose Hospital, Melrose. Subject Acute Anterior Poliomyelitis—Its Diagnosis and Treatment. Instructor R. Cannon Eley Joseph H. Fay, *Chairman*

MIDDLESEX SOUTH

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DEATH

GUGENBERGER — JOSEPH GUGENBERGER, M.D., of 460 Park Avenue, Worcester, died February 28, 1938 He was in his forty fifth year

He was a native of Alsace Lorraine, but came here when very young He received his early education in Holvoke and later went to the Worcester City Hospital to study nursing At the outbreak of the World War he postponed his training to serve as a sergeant in the Medical Corps at Fort McHenry, Baltimore, Md. After the Armistice he returned to the Worcester City Hospital and finished his training, graduating in 1920

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Dr Gugenberger was a member of the American Medical Association and a fellow of the Massachusetts Medical Society

His widow, two brothers, and two sisters survive him.

MISCELLANY

ANNOUNCEMENT OF THE FRANCIS AMORY SEPTENNIAL PRIZE OF THE AMERICAN ACADEMY OF ARTS AND SCIENCES UNDER THE WILL OF FRANCIS AMORY

In compliance with the requirements of a gift under the will of the late Francis Amory of Beverly, Massachusetts, the American Academy of Arts and Sciences announces the offer of a septennial prize for outstanding work with reference to the alleviation or cure of diseases affecting the human genital organs, to be known as the Francis Amory Septennial Prize. The gift provides a fund, the income of which may be awarded for conspicuously meritorious contributions to the field of knowledge "during the said septennial period next preceding any award thereof, through experiment, study or otherwise in the diseases of the human sexual generative organs in general. The prize may be awarded to any individual or individuals for work of "extraordinary or exceptional merit" in this field.

In case there is work of a quality to warrant it, the first award will be made in 1940 The total amount of the award will exceed ten thousand dollars, and may be given in one or more awards. It rests solely within the discretion of the Academy whether an award shall be made at the end of any given seven-year period, and also whether on any occasion the prize shall be awarded to more than a single individual.

tient had felt no fetal motions for twenty-four hours

The family history was unimportant, and her past history was essentially negative. There had been thirteen full-term pregnancies and one early miscarriage. In 1912 a pelvic abscess developed after one delivery and this was drained.

The patient was not followed in the prenatal clinic and so far as was known had had no prenatal care at all. Physical examination on admission showed a woman who had evidently lost a good deal of blood. The mucous membranes were pale. The lungs were normal, and there were no rales. The heart showed no murmurs or enlargement. The sounds were very weak, with regular rhythm and a rate of 64 per minute. The blood pressure was 50 systolic, 30 diastolic. The abdomen showed a full-term uterus in constant contraction. No fetal heart sounds were heard, and no fetal motions were felt. Rectal examination revealed that the head was in the pelvis, and the cervix dilated to admit two fingers. She was still bleeding.

The patient was at once given 500 cc of 10 per cent glucose with 15 units of insulin, intravenously, morphine and sodium amytal were given to control the patient's restlessness. Her blood was taken for typing, and a compatible donor secured. A Spanish windlass was applied to the abdomen and pressure made on the uterus. The patient was also given Thymophysin to stimulate uterine contraction and hasten delivery. During this time the blood pressure remained very low, the pulse rate was 64 per minute but the volume small. The patient was in severe shock. At 1 p. m., 1000 cc of saline solution was administered under the breasts, 500 cc of citrated blood was transfused at 4 p. m., at which time the patient's pulse was becoming weaker. Hot water bottles and blankets were applied and restoratives given. The patient had been bleeding since admission, and by 6 p. m. it was quite evident that she was steadily losing ground. After consultation among the staff it was decided that the patient's only hope was immediate delivery. Under nitrous oxide the membranes were ruptured, dilatation of the cervix was completed, and a dead baby delivered by internal podalic version, the baby weighed 5 lb, 9 oz. The uterus did not contract well, and the patient continued to bleed, hence, the uterus was firmly packed. As the patient was in very poor condition, she was given oxygen and carbon dioxide, intravenous glucose and injections of caffeine and sodium benzoate, but her condition grew steadily worse, and she died at 7.55 p. m.

At autopsy, approximately 200 cc of thin fluid blood was found on opening the abdominal cav-

ity. The important features of the examination are given in the following extracts: "The serosa of the jejunum and ileum show occasional dark red areas completely encircling the wall for a distance of about 7 cm. Otherwise the serosa is negative. The stomach contains approximately 2 liters of thin bright-red blood. The duodenum, jejunum and upper end of the ileum contain similar bright-red blood. Upon washing this away, the mucosa lining the stomach, duodenum and jejunum is markedly injected, the capillaries being very prominent and strongly suggesting a possible source of oozing. This capillary engorgement is most marked beneath the regions of redness in the serosa, above noted. No frank rupture of vessels can be found. The esophagus shows no evidence of varices. At no point in the gastrointestinal tract is there any evidence of cancer."—"The uterus is massively distended and thinned, extending upward halfway to the umbilicus. Its serosa is smooth and glistening. Beneath it are extensive extravasations of blood. At no point is the uterine wall more than 1 cm in thickness. It is completely packed with blood soaked gauze. The endometrium is reddened and, over the recent site of placental attachment, is completely raw. The cervix is widely dilated, easily admitting one's fist."

The following are extracts from the microscopic examination: "*Ileum*. The wall, per se, is negative. The capillaries of the villous processes are enormously distended and in many places frankly ruptured."—"Uterus. The musculature is thinned, shows generalized degeneration and is markedly edematous and in places hemorrhagic. The endometrial surface shows no evidence of infection."

Comment. It must be remembered that this case was treated in 1932. Like treatment today would be open to a good deal of criticism. Transfusion should not have been delayed twelve hours, the patient should have been transfused as soon as she entered the hospital. It is fair to state that a woman who had had thirteen children and who had a baby that weighed only 5 lb, 9 oz, would have been delivered normally long before 6 p. m. had the present-day method of rupturing the membranes as soon as she reached the hospital and applying a Spanish windlass been instituted. The internal podalic version followed by immediate extraction of the child through a cervix that was not dilated possibly added to the shock. Although there is no urinalysis reported, it is quite probable that this woman was suffering from a toxic separation of the placenta and that the blood in her stomach resulted therefrom. While the pathological findings in the jejunum and ileum are not pathognomonic of toxic separation, they are quite compatible.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning March 14

BARNSTABLE

Sunday, March 20, at 4 00 p m., at the Cape Cod Hospital, Hyannis Subject Gonorrhea in the Male. Instructor Roger C Graves. John I B Vail, *Chairman*

BERKSHIRE

Thursday, March 17, at 4 30 p m., at the House of Mercy Hospital, Pittsfield. Subject Some Complications of Labor Analgesics in Labor Instructor Christopher J Duncan Melvin H Walker, Jr, *Chairman*

BRISTOL SOUTH (Fall River Section)

Monday, March 14, at 4 30 p m., at the Union Hospital, Fall River Subject Bleeding in the First Trimester of Pregnancy Instructor M V Kap-pius. Howard P Sawyer and Robert H Goodwin, *Chairmen*

ESSEX NORTH

Friday, March 18, at 4 00 p m., at the Lawrence General Hospital, Lawrence. Subject Bleeding in the First Trimester of Pregnancy Instructor Judson A. Smith. John Parr, *Chairman*

FRANKLIN

Wednesday, March 16, at 8 00 p m., at the Franklin County Hospital, Greenfield. Subject The Use and Misuse of Prontylin. Instructor Benjamin W Carey, Jr Halbert G Stetson, *Chairman*

HAMPDEN

Thursday, March 17, at 4 00 p m., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8 00 p m., in the Outpatient Department of the Skinner Clinic, Holyoke Hospital, Holyoke. Subject Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor Sylvester McGinn. George D Henderson and George L. Schadt, *Chairmen*

HAMPSHIRE

Wednesday, March 16, at 4 15 p m., in the Nurses Home, Cooley Dickinson Hospital, Northampton. Subject Gonorrhea in the Male. Instructor Oscar F Cox, Jr Warren P Cordes, *Chairman*

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In case there is work of a quality to warrant it, the first award will be made in 1940 The total amount of the award will exceed ten thousand dollars, and may be given in one or more awards. It rests solely within the discretion of the Academy whether an award shall be made at the end of any given seven year period, and also whether on any occasion the prize shall be awarded to more than a single individual.

While there will be no formal nominations, and no formal essays or treatises will be required, the Committee invites suggestions, which should be made to the Amory Fund Committee, care of the American Academy of Arts and Sciences, 28 Newbury Street, Boston, Massachusetts

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR JANUARY, 1938

DISEASES	JANUARY 1938	JANUARY 1937	FIVE YEAR AVERAGE*
Anterior poliomyelitis	0	1	1
Chickenpox	2196	1772	1786
Diphtheria	17	20	63
Dog bite	640	580	451
German measles	57	76	241
Gonorrhea	376	519	505
Lobar pneumonia	532	843	835
Measles	566	4024	2714
Meningococcus meningitis	3	13	10
Mumps	618	719	905
Paratyphoid B	1	0	0
Scarlet fever	1163	991	1150
Syphilis	433	510	425
Tuberculosis pulmonary	270	295	292
Tuberculosis other forms	38	26	33
Typhoid fever	7	3	6
Undulant fever	2	5	2
Whooping cough	599	2167	1172

*Based on figures for preceding five years

RARE DISEASES

Diphtheria was reported from Athol, 1, Boston, 7, Chelmsford, 1, Fall River, 1, Haverhill, 1, New Bedford, 1, Revere, 1, Taunton, 3, Woburn, 1, total, 17

Dysentery, bacillary, was reported from Danvers, 4, New Bedford, 1, Somerville, 1, total, 6

Malaria was reported from Newton, 1

Meningococcus meningitis was reported from Boston, 2, North Reading, 1, total, 3

Paratyphoid B was reported from Greenfield, 1

Pfeiffer bacillus meningitis was reported from Norfolk, 1

Septic sore throat was reported from Athol, 1, Boston, 10, Gardner, 5, Medford, 1, Northfield, 2, Quincy, 1, Salem, 2, Somerville, 1, Springfield, 1, Sturbridge, 2, total, 26

Trichinosis was reported from Brookline, 1, Medford, 1, Quincy, 1, total, 3

Typhoid fever was reported from Boston, 1, New Bedford, 1, Quincy, 1, Somerville, 1, Springfield, 1, Worcester, 2, total, 7

Undulant fever was reported from North Adams, 1, Quincy, 1, total, 2

Diphtheria showed a record low incidence.

The incidences of scarlet fever and tuberculosis (other forms) were reported above the five year average.

Pulmonary tuberculosis had record low figures with the exception of January, 1933, which showed an equally low incidence.

Lobar pneumonia, whooping cough and measles were reported at figures considerably below the five year average.

The incidence of undulant fever was not remarkable.

Meningococcus meningitis was reported at a record low figure.

Chickenpox showed record high incidence both for this and any other month to date.

The incidences of mumps and German measles were below the five year average.

Anterior poliomyelitis showed record low incidence.

The incidence of animal rabies was not remarkable.

New foci were reported in Brockton and Dunstable. Previously noted foci in Lowell and the North Shore were active.

STUDY OF NURSING FOR THE TUBERCULOUS

The lack of standards for nursing in tuberculosis sanatoriums has been so much complained about to people with whom national nursing organizations and the National Tuberculosis Association correspond that a study is proposed

Its first object is to determine what constitutes adequate nursing care of tuberculosis patients. Secondly, it is proposed to gather information that will provide an index of the amount of time needed to give that care. The project will be under the direction of the Department of Studies of the National League of Nursing Education.

Dr Sumner H. Remick, superintendent and medical director of the Middlesex County Sanatorium at Waltham, has been advised by Dr Kendall Emerson, managing director of the National Tuberculosis Association, and Miss Mary A. Hickey, R.N., chairman of the Joint Committee for the Study of Tuberculosis Nursing, that the Middlesex County Sanatorium has been selected as one of the limited number of institutions where the study will be made.

Dr Remick has replied favorably indicating that he hopes that the study will be of service not only to his but to other tuberculosis sanatoriums

VOCATIONAL SERVICE BUREAU OF THE AMERICAN PHYSIOTHERAPY ASSOCIATION

Trained physiotherapists are always available through the Vocational Service Bureau of the American Physiotherapy Association. This association was organized very soon after the close of the World War, the charter members being former reconstruction aides-in-service. Since then the membership has increased to more than 800. The present requirements for membership are an approved course in physical therapy of not less than nine months, following graduation from a school of nursing or physical education which meets with the requirements of the individual states and one year's practice in physical therapy within two years of graduation from an approved school of physical therapy. These requirements have been approved by the Council on Medical Education and Hospitals of the American Medical Association. The object in having these qualifications for membership is to provide, for the hospitals, schools for crippled children and offices of physicians, trained physiotherapists who are able to follow physicians' orders intelligently and thoroughly.

Those desiring such service should communicate with Miss Edith Munro, 483 Beacon Street, Boston (Ken 8000)

CORRESPONDENCE

PATHOLOGICAL TECHNIC

To the Editor While heartily agreeing with the reviewer in his praise of Dr Sidney Farber's valuable book *The Postmortem Examination* I feel that I must take exception to one statement by the reviewer "There are minor faults, such as the indication that removal of the organs of the neck is a standard and usual procedure in autopsy technic. I can hardly believe that the reviewer meant to imply that routine examination of the organs of the neck is not standard and usual. I believe that what he did mean to imply was that removal of all

the organs of the neck, including trachea, larynx and tongue, is not a usual procedure at least in adults.

Any pathologist who regards an autopsy complete without careful examination of the thyroid, cervical lymph nodes and parathyroids, together with inspection in situ of the trachea and larynx, can hardly be said to be performing a standard autopsy

SHIELDS WARREN, MD

New England Deaconess Hospital,
Boston, Massachusetts.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

To the Editor In addition to the articles enumerated in our letter of February 7 the following have been accepted

Abbott Laboratories

Sulfanilamide—Abbott

Tablets Sulfanilamide—Abbott, 5 gr

Tablets Sulfanilamide—Abbott, 7½ gr

Ampules Ephedrine Hydrochloride 5 per cent and
Procaine Hydrochloride 1 per cent, 1 cc.

Ampules Ephedrine Hydrochloride 2½ per cent and
Procaine Hydrochloride 1 per cent, 2 cc.

Ampules Silver Nitrate Solution, 1 per cent

Hypodermic Tablets Procaine Hydrochloride, 1/3 gr
Epinephrine 1/4000 gr

Bilhuber Knoll Corporation

Metrazol Sterile Aqueous Solution 10 per cent

Hypodermic Tablets Dilaudid Hydrochloride, 1 mg
(1/64 gr)

Hypodermic Tablets Dilaudid Hydrochloride, 1.25 mg
(1/48 gr)

International Vitamin Corp.

I.V.C. Viosterol (A.R.P.I. Process) in Oil

I.V.C. Cod Liver Oil Vitamin Concentrate Tablets

Lakeside Laboratories, Inc.

Ampules Mercury Succinimide 0.01 gm. (1/6 gr)

Lederle Laboratories

Mixed Grasses Pollen Antigen—Lederle (June
Grass, Orchard Grass, Sweet Vernal Grass,
Red Top and Timothy in equal parts)

PAUL NICHOLAS LEECH, *Secretary*

535 North Dearborn Street,
Chicago, Illinois.

REPORT OF MEETING

THE WILLIAM HARVEY SOCIETY

A meeting of the William Harvey Society was held on January 14 at the Beth Israel Hospital. Dr James J. Hepburn presided and after a brief historical review of thoracic surgery introduced the speaker of the evening Dr Edward D. Churchill who spoke on "Thoracic Surgery."

In opening his talk he pointed out that progress in surgery of the chest had lagged behind that of other branches of surgery until the last 10 or 15 years because thoracic surgery depends on an accurate knowledge not only of anatomy, pathology and principles of asepsis, but also of the principles of cardiorespiratory physiology. The rapid development of the x ray, the use of radio-opaque oil in injections and the use of the bronchoscope are other important factors in the development of this prominent branch of surgery

Empyema is the most frequent of the surgical diseases of the chest which is seen by the general practitioner and which requires speedy treatment. The principles used in the treatment of empyema are first, drainage of the pus by a method suited to the patient so that there will be no further crippling of the cardiorespiratory functions, secondly, a restoration of the function of the lung, and thirdly, the obliteration of the infected cavity. The general practitioner must make an early diagnosis and should use an aspirating needle if there is doubt. It is important to know when to remove the drainage tube, as much damage can be done by leaving the tube in too long. Chronic empyema is a distressing condition which usually results from improper treatment. Lantern slides of a case of chronic empyema were shown. These cases require very extensive surgery.

The field of tuberculosis has only recently been invaded by thoracic surgeons. The first operation of this sort that was done in Boston occurred in 1920. The fundamental principle upon which this type of therapy is based is putting the diseased lung at rest and repairing the damage by collapsing the cavities. Pneumothorax is used wherever possible and is effective when a good collapse can be obtained. In certain cases adhesions will prevent this method from giving collapse, and in many of these cases the adhesions can be severed. The phrenic nerve at times is crushed to help put the lung at rest. Thoracoplasty is used where other means are not effective, the ribs being resected over the pleura. The progress in this operation has been rapid in the last decade, and at the present time a good collapse can be obtained without deforming the patient excessively. Dr Churchill spoke briefly on tuberculous empyema and pointed out the importance of always demonstrating pyogenic organisms before draining any empyema because if it is tuberculous it should not be drained.

In the treatment of patients with lung abscesses the careful combination of medical and surgical care is necessary. In certain cases drainage is done, but a needle should never be introduced because of the danger of causing pyopneumothorax. Dr Churchill warned against tonsillectomies being done in the home, particularly under general anesthesia, because of the danger of postoperative lung abscess. In certain cases it is necessary to remove a whole lobe of the lung in order to get rid of the abscess.

In the treatment of bronchiectasis it is found that simple drainage or collapse is not effective. The involved lobe must be removed. The mortality in these cases at the Massachusetts General Hospital since 1930 has been 44 per cent. Usually the patients are debilitated at the time operation is contemplated.

Primary carcinoma of the lung seems to be on the increase. It is absolutely necessary to have early x rays and determine the cause of chest symptoms, because the surgical treatment of this condition depends entirely on the early diagnosis. One lobe, two, or an entire lung may be removed for this condition. Total pneumonectomy is still a dangerous operation. Operation in these cases is feasible in about 30 per cent. In the 18 cases done at the Massachusetts General Hospital, 6 are living, 5 are dead of metastases and 7 died following operation. Benign tumors usually cannot be differentiated from carcinoma. Hemoptysis is often an early symptom in these cases. Examples of this type of tumor are dermoid cysts, echinococcus cysts, thyroid adenomas and neurofibromas.

Tumors of the ribs which occur near the chondral junction are frequently slow growing chondrosarcomas and the entire rib should be removed. Dr Churchill closed by stating that there were many other problems of

chest surgery, including surgery of the esophagus, diaphragmatic hernias and the removal of adenomatous goiters. He feels that great progress will be made in the future.

NOTICES

REMOVALS

ARAM KAVALGIAN, M.D., announces the removal of his office to 435 Mt. Auburn Street, Watertown

JAMES B. HICKS, M.D., announces the removal of his office to 1101 Beacon Street, Brookline.

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve-thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen discussed, and when indicated, treated with radium and high-voltage x ray.

Physicians are welcome to visit this clinic and bring a patient to the clinic for diagnosis

THOMAS WILLIAM SALMON MEMORIAL LECTURES

The Salmon Committee on Psychiatry and Mental Hygiene invites the medical profession and its friends to The Sixth Series of Thomas William Salmon Memorial Lectures

This series will be given by Dr. David Kennedy Henderson, physician superintendent of the Royal Edinburgh Hospital for Mental Disorders, Scotland, April 18, 19 and 20, at the New York Academy of Medicine, 2 East 103rd Street, at 8 30 p. m.

Dr. Henderson will speak on "Psychopathic States" according to the following schedule

April 18 Their Place in Psychiatry

April 19 Their Characteristics as Evidenced by Aggression, Inadequacy and Creativeness

April 20 Their Understanding and Synthesis.

Dr. Henderson is professor of psychiatry at the University of Edinburgh and is well known as a consultant and lecturer. He was a major in the World War and the author of several papers on the war psychoses. He holds the degrees of F.R.C.P. (Edinburgh) and F.R.F.P.&S (Glasgow) and is the author of more than thirty publications on psychiatric subjects

THE SIR WILLIAM OSLER SOCIETY

The annual lecture of the Sir William Osler Society of Tufts College Medical School will be given on Friday evening, March 18, in the auditorium of the Beth Israel Hospital, at 8 00. Dr. Henry A. Christian will speak on "The Fruition of the Clinician."

STANLEY STELLAR, *Secretary*

NEW ENGLAND SOCIETY OF PHYSICAL MEDICINE

The next regular meeting of the New England Society of Physical Medicine will be held at the Hotel Kenmore, Boston, on Wednesday evening, March 16, at 8 o'clock. The council will meet at 6 00, and informal dinner will be served at 6 30 in the Empire Room.

Dr. Heinrich Brugsch and Dr. Joseph H. Pratt will speak on "The Indications and Contraindications of Ultra Short Wave Therapy based on observations of cases

treated at the Boston Dispensary. Discussion Dr. William D. McFee

All members of the medical profession are cordially invited to attend.

WILLIAM D. McFEE, M.D., *Secretary*

THE GEORGE W. GAY LECTURE ON MEDICAL ETHICS

The George W. Gay Lecture on Medical Ethics "A Few of the Rules" will be given by Dr. Reginald Fitz, in amphitheater E of the Harvard Medical School, on Tuesday, March 15, at 5 00 p. m.

MASSACHUSETTS MEMORIAL HOSPITALS

There will be a luncheon meeting of the surgical section in the Aid Association Room, Talbot Memorial Building, 82 East Concord Street, Boston, on Friday, March 11, at 12 o'clock noon.

MILO C. GREEN, M.D., *Secretary*

CAMBRIDGE HOSPITAL

The regular clinicopathological meeting of the staff of the Cambridge Hospital will be held at the hospital, 330 Mt. Auburn Street, Cambridge, on Tuesday, March 15, at 8 30 p. m.

All members of the medical profession are cordially invited to attend.

JOSEPH M. WADDEN, M.D., *Secretary*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, March 22, at 8 15 p. m.

PROGRAM

Presentation of Cases

The Pigments and Color of Living Human Skin. Dr. E. A. Edwards and Dr. S. Q. Duntley

Medical students and physicians are cordially invited to attend

MARSHALL N. FULTON, M.D., *Secretary*

BOSTON SOCIETY OF ANESTHETISTS

The next regular meeting of the Boston Society of Anesthetists will be held at the Hotel Kenmore, on Tuesday, March 15, at 7 45 p. m.

Dr. G. Philip Grabfield will speak on "Clinical Thoughts on Pharmacology of Central Nervous-System Depressants"

LEO V. HAND, M.D., *Secretary*

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

The next meeting of the Boston Society of Psychiatry and Neurology will be held at the Boston Medical Library, on Thursday evening, March 17, at 8 15

PROGRAM

The Pathogenesis of Syphilitic Optic Atrophy. Dr. Samuel H. Epstein

Psychoanalytic Observations on Two Cases with Preconvulsive Aurae. Dr. Ives Hendrick

Electrical Signs of Corneal Lesions. Dr. Denis Williams

H. HOUSTON MERRITT, M.D., *Secretary*

TUFTS MEDICAL ALUMNI CLUB OF WORCESTER COUNTY

There will be a meeting of the Tufts Medical Alumni Club of Worcester County on Wednesday evening, March 16, at the Bancroft Hotel. Dinner will be served at 6.30, the business meeting will be held at 7.30

Dr Abraham Myerson will speak on Human Autonomic Pharmacology'

C J BYRNE, M.D., *President*
N S SCARCELLO, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MARCH 14

TUESDAY MARCH 15

- *9-10 a. m. Boston Dispensary Clinicopathological Conference. Dr R. C. Wadsworth.
- 10 a. m. 12.30 p. m. Tumor clinic. Boston Dispensary
- *12 m. South End Medical Club. Headquarters of the Boston Tuberculosis Association 554 Columbus Avenue, Boston
- 7.45 p. m. Boston Society of Anesthetists. Hotel Kenmore Boston
- 5 p. m. George W. Gay Lecture on Medical Ethics. Amphitheater E of the Harvard Medical School.

WEDNESDAY MARCH 16

- *9-10 a. m. Boston Dispensary Hospital case presentation. Dr S J Thannhauser
- 8 p. m. New England Society of Physical Medicine. Hotel Kenmore, Boston
- *12 m. Clinicopathological conference. Children's Hospital Amphitheater

THURSDAY MARCH 17

- 8.30-9.30 a. m. Exchange visit, surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals, held this week at the Children's Hospital
- *9-10 a. m. Boston Dispensary Allergic Manifestations in Certain Dermatoses. Their Recognition and Treatment. Dr Francis M. Thurston.
- 8.15 p. m. Boston Society of Psychiatry and Neurology Boston Medical Library 8 Fenway

FRIDAY MARCH 18

- *9-10 a. m. Boston Dispensary Certain Clinical Features of the Natural History of Rheumatic Fever and Heart Disease. Dr T. Duckett Jones.
- *10 a. m. 12.30 p. m. Tumor clinic Boston Dispensary
- 12 m. Clinical meeting of the Children's Medical Service, Massachusetts General Hospital, Ether Dome.
- 8 p. m. Sir William Osler Society Auditorium Beth Israel Hospital Boston

SATURDAY MARCH 19

- *9-10 a. m. Boston Dispensary Hospital case presentation. Dr S. J. Thannhauser
- *10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A. Christian

SUNDAY MARCH 20

- 4 p. m. Illustrated public health lecture, Faulkner Hospital auditorium. Diseases of the Prostate Gland (men only) Dr Franklin Balch, Jr
- 4 p. m. Free public lecture. Harvard Medical School amphitheater of Building D. The Family Medicine Cabinet. Home Remedies and When to Use Them Dr Reginald Fitz.

Open to the medical profession.

MARCH 10 11 12—New England Hospital Association. Page 51 Issue of January 6.

MARCH 11—Massachusetts Memorial Hospitals Luncheon meeting of surgical section. Page 450

MARCH 15—South End Medical Club 12 noon at the headquarters of the Boston Tuberculosis Association 554 Columbus Avenue, Boston.

MARCH 15—Boston Society of Anesthetists. Page 450

MARCH 15—George W. Gay Lecture on Medical Ethics. Page 450

MARCH 15—Cambridge Hospital Clinicopathological meeting of staff Page 450

MARCH 16—Tufts Medical Alumni Club of Worcester County Notice above

MARCH 16—New England Society of Physical Medicine. Page 450

MARCH 16—Brookfield Medical Club. Page 406 issue of March 3

MARCH 17—Boston Society of Psychiatry and Neurology Page 450

MARCH 18—Sir William Osler Society Page 450

MARCH 21—Boston Medical History Club 8.15 p. m. Boston Medical Library

MARCH 22—Harvard Medical Society Page 450

MARCH 8 APRIL 1—Postgraduate Institute of the Philadelphia County Medical Society Page 52 issue of February 10

APRIL 5—Greater Boston Medical Society 8.30 p. m. auditorium of E. H. Israel Hospital Boston

APRIL 4-9—The American College of Physicians Page 41 issue of July 1

APRIL 14—Penn. Vet. Association of Physicians Hotel Bartlett 95 Main Street, Haverhill 8.30 p. m.

APRIL 18 19 and 20—Thomas William Salmon Memorial Lectures. Page 450

APRIL 26—New England Society of Psychiatry Page 322 issue of February 17

MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

JUNE 13-17—American Medical Association San Francisco

JUNE 13 OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 282 issue of February 10

OCTOBER 17-21—Clinical Congress of the American College of Surgeons, New York City

OCTOBER 24 '76—Academy of Physical Medicine, Scientific Session. Washington D. C.

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p. m. New Bedford.

ESSEX SOUTH

APRIL 6—Gloucester Hospital Gloucester Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced.

MAY 5—Censors meet at Salem Hospital 3.30 p. m.

MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p. m. Speaker and subject to be announced

FRANKLIN

Meeting will be held at the Franklin County Hospital Greenfield at 11 a. m. the second Tuesday of May

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July

MIDDLESEX EAST

Meetings will be held at the Bear Hill Golf Club Stoughton at 12.15 p. m. on March 16, and May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27

NORFOLK DISTRICT

MARCH 29—Hotel Kenmore. 8.15 p. m. Subject to be announced but to be related to diseases of the kidney Dr Albert A. Hornor

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon.

APRIL 7—At the Quincy City Hospital.

MAY 5—Annual meeting

PLYMOUTH

Meetings will be held at 11 a. m. on March 17 April 21 May 19 and July 21

SUFFOLK

MARCH 15—Joint meeting with Boston Obstetrical Society Page 407 issue of March 3

WORCESTER

APRIL 13—Hahnemann Hospital Worcester Dinner will be at 6.15 to be followed by business session and scientific program.

MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced.

BOOK REVIEWS

Quelques Verites Premieres (Ou Soi Disant Telles) sur Les Maladies Infectieuses A. Lemierre. 76 pp Paris Masson et Cie, 1937 24 Fr fr

This little book is one of a series of nine volumes which are being sponsored by Ombredanne and Fiessinger. The purpose of these books is to have different clinicians who have specialized knowledge of a subject make a se

ries of general statements concerning different diseases. The present volume contains 'verités premières' about infectious diseases and covers the different types of fever, the septicemias, the exanthems, grippe, erysipelas and angina, with remarks on prophylaxis and therapeutics.

Professor Lemierre has listed the various points as aphorisms and most of the statements are well recognized facts to all physicians and students of infectious diseases. There are a number of statements which are noteworthy and anyone interested in infectious disorders will find this book of value.

Les Acquisitions Nouvelles de l'Endocrinologie R. Rivoire.
Third edition 264 pp Paris Masson & Cie, 1937
45 Fr fr

This, the third edition of the author's monograph on recent advances in endocrinology, is an exceptionally good survey, for the student or practitioner, of the status of this subject. For the investigator or one about to write upon the subject the book is utterly useless as there is not a single reference to the literature in the whole volume. This glaring fault reduces the value of the book by at least fifty per cent, in spite of the fact that the author has obviously covered the literature very thoroughly, not only in his own language but also in English. The author's views in his preface to this edition strike the keynote to the whole book, he says that "as one will see on reading the book, the hypothetical side has been greatly cut down and it is for the author a great satisfaction to have seen, little by little, physiological, biochemical and clinical researches confirm in great part the theories which he propounded since the beginning of the new era in endocrinology."

Synopsis of Gynecology Harry Sturgeon Crossen and Robert James Crossen. Second edition 247 pp
St. Louis The C V Mosby Company, 1937 \$3 00

This *Synopsis of Gynecology* is based on Crossen's *Text-book of Diseases of Women*, one of the well known standard works. There are twenty chapters, over one hundred illustrations and a good index, in a volume which is compact, handy, and if one knows how to use a synopsis, useful. In general it is well written, and the synoptic presentation is well made and comprehensive.

But this reviewer suggests that a picture of the ovum accompany the description on page 16, that on page 69 respiratory excursion of the abdominal wall be noted, that the resources of abdominal auscultation be not overlooked. The press work is satisfactory, but the type for headings is confusing, as there is lack of uniformity in using larger type for more comprehensive headings.

Bright's Disease and Arterial Hypertension Willard J Stone. 352 pp Philadelphia and London W B Saunders Company, 1936 \$5 00

This is a very well written and extremely well illustrated summary of what is generally known concerning the facts and theories of Bright's disease. The initial chapter reviewing historical sequences is of more than passing interest. The succeeding chapters in the first half of the book deal with classification of the disease and a discussion of the various chemical phenomena associated with the diagnosis and study of Bright's disease and its complications. This section of the book is very clearly written, but does contain a certain amount of repetition, especially concerning methods of study which are not in general clinical use. A summary of the methods found clinically useful would be helpful.

The second portion of the book deals with a discussion of the specific forms of Bright's disease, with their diagnosis and treatment, and finally, there is a rather brief discussion of hypertension in its relation to kidney disease. At times the reviewer is somewhat confused over the various clinical subdivisions of the disease and feels that perhaps the matter of classification is a little over emphasized. On the other hand, the consideration of the problem of hypertension is perhaps somewhat inadequate.

In general, the book presents nothing new, but it does present a good, sound summary of what is known about Bright's disease, its diagnosis and treatment.

Rose and Carless Manual of Surgery Edited by William T Coughlin American (fifteenth) edition. 1586 pp
Baltimore William Wood & Company, 1937 \$9 00

When a work in a period of forty years has reached fifteen English editions and as many reprints, a number of American editions, and translations in Arabic, Chinese and Hungarian, one is curious to learn the cause of its popularity. The fact that the work covers a very wide field of surgery and is contained in a single volume may appeal to many practitioners and students. As the volume contains about 1600 pages it is necessarily bulky, but its strong binding and calendered paper greatly facilitate its use. The text is clear and concise. The topical arrangement and the employment of heavy faced type for subheadings make it easily readable. Over 900 well selected and well-captioned illustrations and an excellent 50-page, double-column index greatly enhance its value as a reference book.

The preface to the English edition states that new chapters on 'Surgical Shock' and 'Surgery of the Sympathetic Nervous System' have been added and that the chapters on 'Thoracic Surgery,' 'Surgery of the Central Nervous System,' and 'Anesthesia' have been extensively rewritten. The text under examination is edited by William T Coughlin from the fifteenth English edition by Wakeley and Hunter. Some parts of the sections relating to the specialties have been omitted. Chapters on the ear, nose, throat, and genitourinary diseases are retained and comprise 125 pages. The chapters on gynecology and tropical surgery have been omitted from the text. References to them have not been deleted from the index, but at the beginning of the index is a statement that "all entries after page 1536 referred to the British edition only."

The work has a British flavor both in phraseology and terminology. Considering its wide scope it is a splendid practical book. A conspicuous feature is the clear description of gross and microscopic anatomy.

Variations in methods of treatment from some of our own are to be expected and are frequently stimulating. There are, however, certain commissions and omissions which seem of sufficient importance to the reviewer to be noted—the sections on fractures of the neck of the femur and pathologic fractures seem inadequate, there is no mention of the Nather Ochsner operation for subphrenic abscess (page 1145), the tendon suture described is not ideal for hand surgery (page 468), no external part of the sac of a spina bifida should be infolded (page 809), the benefit from Coley toxins cannot be judged in a few days (page 221).

It is a splendid single volume surgery for the student and practitioner, and its up-to-dateness in certain portions is pleasantly surprising in a work of this scope.

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THE DIAGNOSIS, TREATMENT AND END RESULTS IN GONOCOCCAL ARTHRITIS

A Study of Seventy Cases

WESLEY W SPINK, M.D.,* AND CHESTER S KEEFER, M.D.†

BOSTON

GONOCOCCAL arthritis is one of the commonest and most severe complications of a gonococcal infection. Successful treatment depends upon a correct early diagnosis and a course of therapy definitely planned to prevent chronicity and disability. During the past three years we have carried out studies on 70 patients with proved gonococcal arthritis. The present report includes a discussion of the aids in making the correct diagnosis, the therapy utilized and the end results.†

DIAGNOSIS

The criteria for the correct diagnosis of gonococcal arthritis are as follows: (1) a history of a local gonococcal infection, either immediately preceding the attack of arthritis or at some time in the past, (2) smears and cultures of urethral or cervical exudates which reveal the presence of gonococci, (3) positive gonococcal complement-fixation tests of either the blood serum or the synovial fluid, and (4) the presence of gonococci in the aspirated contents of the joints or tendon sheaths.

A past history of gonorrhea in a patient with an acute onset of arthritis is not sufficient evidence for a diagnosis of gonococcal arthritis. If in addition to the history, examination of the blood serum or synovial fluid reveals a positive gonococcal complement-fixation test, we have reason to believe that the patient has gonococcal arthritis. In this connection, we have encountered male patients with an acute arthritis who presented a history of gonorrhea many years previously. There was no evidence of a recurrence of the local in-

fection, and complement-fixation tests of the blood were negative. However, bacteriological examination of synovial fluid aspirated from the joints revealed gonococci in pure culture. Likewise, a group of female patients with acute polyarthritis presented no history of a localized gonococcal infection. The diagnosis of gonococcal arthritis was made only after positive gonococcal complement-fixation tests had been obtained from the blood serum, or gonococci had been isolated from cervical exudates and synovial fluids, or both. The problem of latent gonorrhea as a cause of acute polyarthritis has been discussed in detail elsewhere.¹

In every case where gonococcal arthritis is suspected, one should carefully examine stained smears of prostatic or cervical secretions. Although the finding of gram-negative intracellular diplococci in these smears may be considered sufficient evidence for the diagnosis of gonorrhea, in most instances we have also cultured the secretions. This is particularly necessary in women where the presence of many different organisms may be confusing. Instances have occurred in which gonococci were not demonstrated in smears but culture of the exudates revealed their presence. In every case where the organisms have been isolated in pure culture we have proved them to be gonococci by agglutination and fermentation tests. Growth of the gonococcus is fostered best in an atmosphere with an increased carbon-dioxide tension, and the candle jar, as described by Nye and Lamb,² is utilized for this purpose. The method of culturing such exudates is as follows: Material is obtained from the cervix or urethra with a sterile swab. This is then placed in a tube of veal-infusion broth. A few drops of the broth are then smeared on 15 per cent horse-blood-agar plates. The plates are incubated at 37.5°C in the candle jar for from thirty-six to forty-eight hours. At

*From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital and the Department of Medicine, Harvard Medical School, Boston.

†We are indebted to Dr. Otto Hermann and his associates on the Orthopedic Service of the Boston City Hospital for the surgical care of these patients.

Formerly resident physician, Thorndike Memorial Laboratory, Boston City Hospital. Now assistant professor of medicine, University of Minnesota Medical School.

Associate professor of medicine, Harvard Medical School. Associate physician, Thorndike Memorial Laboratory, Boston City Hospital.

the end of this time colonies of the gonococcus appear glistening, elevated and slightly opaque

As has been indicated above, the gonococcal complement-fixation test is of considerable value in the diagnosis of gonococcal arthritis. This test can be done on either blood serum or synovial fluid. In several patients in our series the first definite evidence that they had gonococcal arthritis was based on a positive gonococcal complement-fixation test. Myers and Keefer³ have discussed in detail the results of this test, and more recently Warren, Hinton and Bauer⁴ have advocated its more general use. The results of the gonococcal complement-fixation test of the blood and synovial fluid in the present series of cases are tabulated in Table 1.*

Table 1 *Results of Gonococcal Complement-Fixation Tests on Synovial Fluids and Blood Serums of Patients with Gonococcal Arthritis*

Synovial fluids	
Sterile fluids	
Positive	16
Negative	7
Doubtful	1
Infected fluids (gonococci)	
Positive	5
Negative	6
Blood serums	
Positive	47
Negative	5
Doubtful	2

The higher incidence of positive reactions on the blood is due to repeated tests' being done on the blood, whereas a comparable number of determinations could not be carried out on synovial fluid. Six of the eleven samples of synovial fluid with gonococci present gave negative fixation reactions. As we have explained elsewhere,⁵ this absence of antibodies accounts in part for the finding of the gonococci. We have found positive reactions as early as the first week of the disease, and some patients have continued to have positive tests from two to three years after all symptoms have subsided.

The aspiration and study of synovial fluid from patients with arthritis are of value in the differential diagnosis. The routine procedure after obtaining the fluid includes a total-cell count, gonococcal complement-fixation test, Wassermann test and culture. Myers, Keefer and Holmes⁶ have described the characteristics of the synovial fluid in gonococcal arthritis. They were able to divide such fluids into two groups, on the basis of the presence or absence of organisms. The average cell count was higher in the infected fluids which had a preponderance of polymorphonuclear leukocytes. In both types of fluid the total protein content was above normal, the nonprotein nitrogen value was the same as that of the blood, and the sugar content varied according

to the presence or absence of organisms, the number of leukocytes and the blood-sugar level. In our series the total cell count of the sterile fluids was usually below 25,000 per cubic millimeter. In 17 (24 per cent) of the cases we were able to isolate gonococci from the synovial fluid, and they were isolated from material obtained from a tendon sheath in 4 patients.

TREATMENT

In order to clarify the end results of treatment, the patients have been divided into three groups. Group I comprised 26 patients who were treated by medical means alone. In Group II, 24 patients had sufficient evidence of an effusion into one or more joint spaces to warrant aspiration of the synovial fluid in addition to medical therapy. Group III was composed of 20 patients whose joints were aspirated and also opened and followed by lavage.

The medical treatment of all these patients had for its objectives the maintenance of the patient's general nutrition, the prevention of pain and deformities, the restoration of full function of diseased joints through physiotherapy, and the control of the local genitourinary tract infection. The patients were given a diet sufficient in caloric content and supplemented with accessory food-derived substances. Some of them developed a severe hypochromic anemia during the course of their illness, which was corrected by administering ferrous sulfate, except in two cases where whole-blood transfusions were given. Joint pains were relieved by immobilization and by medication in the form of salicylates and opiates.

During the acute stage of the arthritis, few attempts were made to treat the local genitourinary infection, aside from vaginal douches. On several occasions when fever and joint pains had subsided, massage of the prostate gland was done. It was not unusual for patients to have a flare up of their polyarthritis with fever following this maneuver.

Vaccines were administered intravenously to 11 patients. The vaccines utilized were a suspension of typhoid-paratyphoid bacilli and an autogenous, heat-killed, saline suspension of gonococci. A total of 50,000,000 organisms was the initial intravenous dose of the suspension of typhoid paratyphoid bacilli. Depending upon the reaction, each succeeding dose was increased by from 25,000,000 to 50,000,000 organisms. A total of five injections was given, at intervals of two or three days. Patients treated in this manner usually experienced chills and fever a few hours after the injections. Seven patients were treated with the typhoid paratyphoid vaccine, 2 of these were also given an autogenous gonococcal vaccine intravenously. Five patients were treated with gonococcal vaccine alone,

*The tests were done by the Wassermann Laboratory of the Massachusetts Department of Public Health.

and approximately the same doses were used as with the typhoid-paratyphoid vaccine. More severe reactions occurred after the administration of gonococcal vaccine than after that of typhoid paratyphoid vaccine. Although it was difficult to evaluate the results of vaccine therapy, patients with severe pains in the joints appeared to obtain more symptomatic relief than did those with only moderate pain.

Antigonococcal horse serum was given intravenously to 1 patient who had polyarthritus and gonococcal septicemia without endocarditis. Following the administration of serum his blood became sterile, but the prostatic secretion continued to show gonococci in stained smears. The use of antigonococcal horse serum and gonococcal vaccine in the treatment of gonococcal infections has been discussed in more detail elsewhere.⁷

In Group II, one or more knee joints were aspirated in 21 of the 26 patients. Cultures of all these synovial fluids were sterile. A wrist joint was aspirated in 2 cases. The culture of the aspirated material in 1 showed gonococci, the other was sterile. One infected shoulder joint was aspirated.

In Group III, the surgical treatment was necessary either because the synovial fluid was so thick that all of it could not be aspirated through a needle, or because of the presence of gonococci in the fluid. In many cases infected joints were aspirated several times, but gonococci were constantly present. They were eradicated from the joint cavity only after exposing the joint space and thoroughly washing it out with either warm saline or a 1:10,000 solution of bichloride of mercury. All the operative wounds were tightly closed immediately after this procedure. Synovial fluid often reaccumulated following the operation, but it was easily aspirated and was found to be sterile. We were unsuccessful in attempting to sterilize a knee joint in 1 patient by injecting potent antigonococcal horse serum directly into the synovial cavity.⁷ In 17 of the patients in this group knee joints were washed out, 2 had an elbow joint treated in this manner, and 1 had a hip joint opened. Gonococci were recovered from the synovial fluids in 16 cases.

RESULTS

Group I All 26 patients except 1 were treated in the hospital, the average stay being fifty days. Two of these died. One was a forty-two-year-old man who developed an acute glomerulonephritis due to a gonococcal infection and died from uremia. We have reported this case in a review of the renal complications of gonococcal infections.⁸ In the second fatal case, that of a twenty-one-year-old pregnant woman, the patient had an acute process in-

volving the right hip joint, she contracted pneumonia and died. Other complications included acute appendicitis (confirmed at operation), gonococcal septicemia, metastatic conjunctivitis and pregnancy. Upon leaving the hospital, 18 patients, or 75 per cent of the group, were completely free of all joint symptoms, with no limitation of motion and no roentgenological evidence of joint destruction, the 2 patients who died are not included here. Of the remaining 6, 1 ultimately had a complete bony ankylosis of a wrist joint, 1 had roentgenological evidence of destruction of one metatarsal joint, but with no limitation of function, 2 had a partial ankylosis of the wrist joints, and 2 had a residual soreness of joints of the lower extremities, which disappeared after several weeks.

Group II The average stay in the hospital for this group was fifty-three days. The aspirated synovial fluid from 22 of the patients was sterile. Infected fluid was aspirated from the shoulder joint of 1 individual and from the wrist joint of another. None of the group died. Four male patients had had a similar attack of arthritis in the past following a gonococcal infection. Two patients had a proved gonococcal septicemia and recovered without specific therapy. Two men had the skin lesions of keratoderma blenorrhagicum as a complication of their illness. Three patients had a metastatic sterile conjunctivitis, and 1 had iridocyclitis, resulting in loss of vision in one eye. One woman had a sterile meningitis on entry, the spinal fluid showed an increase in cells, but no organisms were demonstrated by smear or culture. Follow-up observations on these patients revealed that only 1 had a recurrence of joint symptoms, and this followed a second attack of gonococcal urethritis. Fourteen (48 per cent) of the 24 patients had complete recovery of joint function with no roentgenological evidence of joint destruction. Two patients had bony ankylosis of a wrist joint. One had a hyperflexion deformity of the toes. Another had destruction of the metatarsal joint of the first toe but no limitation of function. The remaining 6 patients had residual periarticular adhesions of the knee joints with slight limitation of motion on flexion (from 10 to 20 degrees) but no limitation on extension.

Group III Gonococci were recovered from the synovial fluid in 15 patients, while the fluid from 5 was sterile. The average stay in the hospital was sixty-one days. Two patients had keratoderma blenorrhagicum as a complicating skin lesion. One of this group of patients entered the hospital in diabetic coma, which was followed by bronchopneumonia and a purulent infection of an elbow joint. The presence of organisms in the synovial fluid of

the end of this time colonies of the gonococcus appear glistening, elevated and slightly opaque

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*The tests were done by the Wassermann Laboratory of the Massachusetts Department of Public Health.

GALLSTONE ILEUS

FRANKLIN G BALCH, JR, M.D.*

BOSTON

INTESTINAL obstruction due to gallstones is comparatively so uncommon that the average surgeon is not apt to encounter many such cases in the course of his practice. The writer has been fortunate enough to operate on such a patient and to assist at the operation on another during the last ten years.

This study is based upon 10 cases operated on at the Massachusetts General Hospital between 1898 and 1932, and upon 7 other cases operated on by colleagues who have allowed me to report them.

Frequency Scudder¹⁵ reported from the Massachusetts General Hospital, between 1898 and 1907, 121 cases of intestinal obstruction, only 1 of which was due to a gallstone. Richardson¹³ from the same hospital, from 1908 through 1917, reported 118 cases of intestinal obstruction, 1 of which was due to a gallstone. From 1918 through 1932, 8 cases due to gallstones have occurred out of a total of 263 cases of acute intestinal obstruction. Thus from 1898 through 1932 there were 10 cases among 502 obstructions, an incidence of 2 per cent. Barnard² reported that the London Hospital records for the thirteen years 1893 to 1905 showed that there were 14 cases of intestinal obstruction due to gallstones out of a total of 669 cases of intestinal obstruction due to all causes. The same author quotes Leichtenstern as reporting 41 cases of gallstone obstruction in a total of 1152 cases. As seen from Table 1, the incidence varies anywhere from 0.4 to 3.5 per cent.

Table 1 Incidence of Gallstone Ileus in Relation to All Cases of Intestinal Obstruction

	TOTAL CASES OF OBSTRUCTION	CASES OF GALLSTONE OBSTRUCTION	INCIDENCE %
Leichtenstern	1 152	41	3.5
Barnard ² (1910)	669	14	2.1
Souttar ¹⁶ (1925)	1 655	28	1.7
Vick ¹⁷ (1932)	3 625	47	1.3
Meyer and Spivack ¹¹ (1934)	505	2	0.4
M. G. H. (1937)	502	10	2.0

No recent estimate as to the total number of cases reported has been made. In 1914 Wagner¹⁸ reported 334 cases which he had been able to find up to that time in the literature and in his own practice. In 1922 Abbott and Hunt¹ reported 23 cases over an eight-year period. In the discussion of this paper, 8 more cases were added. Moore¹² in an excellent article in 1925 reported 4 cases and estimated that up to that time some 400 cases had been recorded.

Sex Women are much more prone to obstruction than men, in the proportion of about 15 to 1, whereas the incidence of gallstones in women and men is in about the proportion of 2 or 3 to 1. Why this difference occurs is difficult to explain. Moore's¹² 4 cases were all in women. Three of Abbott and Hunt's¹ cases were in women and 1 in a man. Of Martin's¹⁰ 3 cases, 2 were in women and 1 in a man. Of the 17 cases in this series, 16 were in women and 1 in a man.

Age This type of obstruction usually occurs in the later decades. The average age in this series was sixty-six, the youngest patient was in the fifth decade and the oldest in the ninth.

Mortality Partly because the disease occurs most commonly in later life, the mortality is high. In 1925 Souttar¹⁶ reported the results of acute intestinal obstruction from seven London hospitals for the years 1920 to 1925. Out of a total of 1655 cases of intestinal obstruction 28 were due to gallstones, with a mortality of 50 per cent. In 1932 Vick¹⁷ reported a series of 3625 cases of acute intestinal obstruction due to all causes, from the files of twenty-one hospitals in Great Britain between 1925 and 1930. Of these, 47 cases were due to gallstones, with a mortality of 70 per cent. The mortality from various other sources is shown in Table 2.

Table 2. Intestinal Obstruction from Gallstones

	NO. OF CASES	MORTALITY %
Lobstein ⁵	31	61
Courvoisier ⁶	125	44
Scheller ¹⁴	82	56
J. Hutchinson ⁷	—	50
Evans ⁸	15	40
Barnard-	14	61
Martin ¹⁰	3	0
Moore ¹²	4	75
Abbott and Hunt ¹	4	50
M. G. H. service cases	10	70
Private cases	7	57

An important factor in mortality is the length of duration of obstruction before operation is performed. Of this series of 17 cases, 8 were operated on after three days of obstruction and only 1 patient survived, whereas of the 9 cases operated upon during the first three days only 4 patients died.

Symptoms Obstruction due to gallstones gives a train of symptoms similar to obstruction due to other causes, namely pain, vomiting and obstipation. The obstruction from gallstones, however, is due to a true obstruction of the lumen of the bowel plus spasm, and not to a strangulation. As a result, the symptoms are often intermittent as

*Assistant in surgery, Harvard Medical School. Assistant surgeon, Massachusetts General Hospital.

a majority of the patients is reflected in the end results. Only 3 patients (15 per cent) ultimately had no limitation of motion of joints. Six had an ankylosis of one joint with less than 10 degrees of joint motion. These included one hip joint, one elbow joint and four knee joints. Three individuals were capable of only 50 degrees of motion of one knee joint. Eight patients had peri-articular fibrosis of one knee joint with from 10 to 15 degrees' limitation of motion on flexion, but with capacity for full extension.

DISCUSSION

The ultimate therapeutic goal for the arthritic patient is the restoration of joint function, and end results should be measured accordingly. It is misleading to state that a particular form of therapy resulted in relief of symptoms, improvement or cure when nothing is said of the use a patient has of his joints. Furthermore, it is often difficult to evaluate the methods of treatment because of an arbitrary division into acute and chronic stages.

Since gonococcal arthritis is due to a specific organism, the ultimate outcome so far as joint function is concerned may be dependent on the numbers of gonococci in the joint tissues. Individuals with an acute arthritis of only a few weeks' duration may have a loss of joint function if large numbers of organisms are present, whereas an arthritis lasting for weeks or months may not result in joint destruction if the effusion is sterile. A large measure of success in the therapy of gonococcal arthritis is dependent on an early diagnosis and the eradication of the organism from the joint cavities.

During the last few years a number of favorable reports have appeared advocating the use of hyperthermia in the treatment of gonococcal arthritis. Hench^{9, 10} and others^{11, 12} have recently reviewed the literature as to this form of therapy. The most favorable results with fever therapy were apparently obtained in patients with acute gonococcal arthritis. We have had no experience with this type of therapy, but believe that it merits further trial.

A closer analysis of our series of 70 patients reveals that 5 had serious involvement of a wrist joint, 3 of these developed complete ankylosis, while 2 had residual soreness and pain on motion that lasted for several weeks. It is apparent that even though the wrist joint is infected, surgical intervention and drainage is highly impracticable. This site of arthritis appears to be highly amenable to fever therapy.

Our experience and that of others is that the knee joint is the one most frequently involved in gonococcal arthritis. Thus, of the twenty-four cases

in which joints were treated by aspiration with out drainage, the knee joint was involved in twenty one. In the twenty cases in which joints were surgically drained and lavaged, the knee joint was involved in eighteen. Of considerable interest is the fact that the poorest end results were obtained in patients whose joints were infected. In some of these patients other types of arthritis were first suspected, especially acute rheumatic fever, so that considerable destruction had ensued before they were opened.

There has been a recurrence of arthritis in 2 of the 70 patients. Both were men, and in each case joint symptoms were precipitated by a recurrent urethral infection three months after discharge from the hospital. Three of the women have had subsequent normal pregnancies, with no exacerbation of joint symptoms.

SUMMARY

We have observed 70 patients with gonococcal arthritis during the past three years. The criteria for making the diagnosis of this type of arthritis are discussed. Group I constituted 26 patients who were treated by medical means only, Group II comprised 24 patients who had an effusion into one or more joints which necessitated aspirations of the synovial fluid, Group III included 20 patients with purulent joint effusions which required surgical drainage. Follow-up studies revealed that 20 of the 26 patients in Group I were free of all joint symptoms, with no limitation of motion. Fourteen of the 24 patients in Group II showed no limitation. Of the 20 patients in Group III, only 3 had a return of complete function of their joints.

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ness anywhere. The white blood cell count was 16,600, the temperature 101.5°F, the pulse rate 120 and the respirations 32. No x ray photographs were taken.

Operation was performed under ether anesthesia as soon as possible. The patient's condition was poor. A midline suprapubic incision was made, which was followed by evisceration of a large portion of the intestines. The obstruction was caused by a large, immovable gallstone with the wall of the bowel contracted about it. The exact point of obstruction could not be determined. The intestine was opened in two places by 1-cm incisions and a large amount of liquid fecal material was withdrawn. During this procedure salt solution was constantly passed over the intestines. The openings were closed with silk sutures following the removal of the gallstone. The wound was closed with through and through silkworm gut sutures. No effort was made to close the skin. The patient died shortly after the operation.

Case 2 A housewife of 71 entered the Massachusetts General Hospital on August 19, 1915, with a history of generalized abdominal pain and fecal vomiting for 2 days with no bowel movement for 3 days. She had been treated with brisk catharsis without either fecal or gas results.

Examination showed a very sick old woman who was unable to give her own history. The abdomen was distended and tender throughout, with visible peristalsis. It was tympanic except in the left flank. No masses or spasm could be elicited. The white-blood cell count was 11,000, the temperature 100.8°F, the pulse rate 118 and the respirations 24. No x ray photographs were taken.

Under novocain anesthesia, laparotomy was performed through a 10-cm. incision just to the left of the midline. The large bowel and most of the small bowel were contracted. The stomach was markedly dilated. A large "fecolith" was found in the upper end of the jejunum. This was removed through a 5-cm. incision, which was closed with a double row of Pagenstecher sutures. The ominal wound was closed without drainage. The patient was in very poor condition following operation. She died in 24 hours. An autopsy showed chronic cholecystitis, with necrosis of the gall bladder wall and wall of the duodenum, wounds from operation for intestinal obstruction, due to a large concretion in the small intestine, probably a gallstone, arteriosclerosis of the mitral valve, slight, with stenosis, hypertrophy and dilatation of the heart, hemorrhagic pneumonia of the lungs, slight chronic pleuritis, left, carcinoma of the stomach, possibly originating in a congenital malformation of the nature of an accessory pancreas, scoliosis.

Case 3 A housewife of 46 entered the Massachusetts General Hospital on February 11, 1919, complaining of per abdominal pain of 2 weeks duration. The pain was colicky and was associated with nausea and vomiting, which occurred ten or twelve times a day. Enemas produced both good fecal and gas results. On the morning of entrance the vomiting was fecal. The patient had had two similar though milder episodes 10 years and 1 year before entrance.

Examination showed a markedly obese woman, quite anorectic. The patient had been given ¼ gr of morphine 4 hours before entry. The tongue was dry and red. The abdomen was tender throughout, with spasm in the right upper and lower quadrants. The left half of the abdomen showed no spasm. The white-blood cell count was 14,400, the temperature 97.6°F, the pulse rate 104 and the respirations 16. No x ray photographs were taken.

Laparotomy was performed shortly after admission. The bowel was adherent in the pelvis. No collapsed bowel was seen. There was dilatation of the large as well as of the small bowel. Owing to the patient's poor condition, further exploration was not done. The adhesions were freed and the patient was returned to the ward almost moribund. She died a few hours after operation. Autopsy showed the following: cholelithiasis, pericholecystitis, with necrosis of the gall bladder and the wall of the duodenum, occluding gallstone in the ileum, acute intestinal obstruction, slight fibrinous peritonitis, fatty metamorphosis of the liver, operation wound from laparotomy.

Case 4 A housewife of 68 entered the Massachusetts General Hospital on March 9, 1922, complaining of generalized abdominal pain, intermittent and associated with vomiting of 3 days duration. At entrance the patient felt better than she had for 24 hours. Her bowels had moved 3 days before entrance, but not since then even with enemata.

Examination showed a moderately tense, considerably distended abdomen, with visible peristalsis. The white-blood cell count was not taken, the temperature was 97°F, the pulse rate 90 and the respirations 18. No x ray photographs were taken.

An immediate operation was done. There was considerable free turbid fluid in the peritoneal cavity. In the pelvis there were several loops of intestine covered with fibrin. A gallstone 4 by 2 by 2 cm., movable only with considerable difficulty, was found in the ileum. This was removed, and the incision was closed with a double layer of silk. Palpation of the gall bladder showed a mass of adhesions. A cigarette drain was placed in the pelvis.

The patient made an uneventful convalescence, and a year later reported that she had had no further trouble except for some pain in the lower end of the scar, where there was a definite hernial ring.

Case 5 A housewife of 70 entered the Massachusetts General Hospital on October 11, 1923, complaining of intermittent umbilical pain associated with vomiting of several weeks duration. There had been two or three attacks a week. Her bowels had moved every day following the use of cathartics.

Examination showed a general moderate tenderness throughout the abdomen, with only slight distention and occasional visible and audible peristalsis. The white-blood cell count was 22,400, the temperature 97°F, the pulse rate 120 and the respirations 20. No x ray photographs were taken.

Operation was performed through a left rectus incision and a gallstone measuring about 3 by 1.5 cm. was found impacted in the ileocecal valve. An attempt to force the stone through the valve was unsuccessful. It was removed through the terminal ileum, with closure of the incision by means of two rows of sutures, one of catgut and one of silk. Examination of the gall-bladder area showed multiple adhesions. The abdomen was closed without drainage. There was considerable nausea and vomiting following the operation and there was infection of the wound. This gradually cleared up, and the patient was discharged 19 days after operation.

Two years later she re-entered the hospital with what appeared clinically to be carcinoma of the pancreas. This impression was confirmed at operation, when the gall bladder was found to be buried in adhesions which puckered the duodenum firmly to it. No biopsy was taken. The patient made a surprisingly uneventful convalescence.

the spasm relaxes and the stone proceeds farther down the bowel. As a certain amount of gas may get by, distention may not be a prominent factor and the patient may continue to pass small amounts of gas by rectum. Since the lumen of the small bowel decreases slightly in diameter as it approaches the cecum, obstruction by a large stone will eventually be complete. Smaller ones may go through the ileocecal valve, if so, they are readily passed by rectum. Barnard² states that stones of less than 2.5-cm diameter will pass spontaneously, and reports that MacLagan⁹ in 1888 had a patient with four attacks of intestinal obstruction with the spontaneous passage of four 2.5-cm stones. He quotes Faber, Abt, Gutterbock and Hahn concerning sizes and points of obstruction. The largest stone reported was 6 cm in diameter and obstructed the upper jejunum. Drew⁵ reported a case where the stone measured 6 by 3 by 10 cm, this patient died. The largest stone in the Massachusetts General Hospital series was 5 cm in diameter and obstructed the terminal ileum.

Diagnosis A positive diagnosis of obstruction due to gallstones is frequently very difficult, but the diagnosis of intestinal obstruction can readily be made from the symptoms. A history of preceding gall-bladder distress or of epigastric pain, associated with vomiting and then relieved for a period, only to recur with pain near the umbilicus and with renewed vomiting, should make one very suspicious of gallstone obstruction. An x-ray of the abdomen is often of value in showing a shadow suggestive of gallstones. Of the 6 cases in this series in which an x-ray was taken, stones were reported in 3. The white-blood-cell count, as in other cases of intestinal obstruction, is usually elevated, but is apt not to be so high as in obstruction due to strangulation.

Mode of Entrance into the Gastrointestinal Tract Most writers agree that the majority of stones pass by way of a fistula between the gall bladder and the duodenum. Courvoisier⁴ stated that in 30 fatal cases, 28 were due to fistula between the gall bladder and duodenum while 2 were due to fistula between the gall bladder and colon. Moore¹² quotes Murphy as reporting 70 cases in which the route of the gallstone was traced. Of these 36 occurred through a gall-bladder-duodenum fistula, 25 through a gall-bladder-ileum fistula, 1 through a duodenum-colon fistula, and 7 through a common duct-duodenum fistula. Of the 7 cases in our series which were autopsied, all were found to have gall-bladder-duodenum fistulas.

Treatment As in any case of acute intestinal obstruction, early diagnosis and operation is imperative. As Richardson¹³ said concerning intestinal obstruction in general, "Operation should be

based on suspicion rather than on certainty." Delay means death. Intravenous saline is needed in order to replace the chlorides lost by vomiting. As a rule the bowel is not gangrenous, so that resection is unnecessary. The stone should be pushed back up the bowel, which can then be opened in a healthy area. On opening the bowel it is advisable that the incision be made in a longitudinal, and sutured in a transverse, direction, as this tends not to constrict the diameter of the bowel. In removing a stone from the bowel, the segment containing the stone should be brought out of the abdominal cavity and well walled off before any incision is made. Gloves and instruments should be changed before the bowel is returned to the abdominal cavity and the wound closed. An ileostomy above the site of obstruction is usually unnecessary, and we believe that it tends to increase the mortality. Unless there is gross contamination of the peritoneal cavity, drainage should not be carried out. We believe that Wangenstein drainage for about forty-eight hours after operation is advisable, since it tends to prevent distention and makes the patient more comfortable. Of the 17 cases in this series, 1 was drained and 3 had an ileostomy. One case was not operated on owing to the patient's poor general condition.

SUMMARY AND CONCLUSIONS

- 1 Seventeen cases of obstruction of the small bowel due to gallstones are reported.
- 2 These occurred most commonly in elderly women.
- 3 Obstruction from this cause differs from the usual type of obstruction of the small bowel in that it is often intermittent in character and that patients may pass gas or even feces during the quiescent periods of an attack.
- 4 Early diagnosis and operation is imperative in this type of obstruction.
- 5 X-ray films should be made, as they may be very important diagnostic aids.
- 6 Ileostomy is usually not necessary, and may be harmful.
- 7 Drainage of the abdominal cavity is as a rule unnecessary.

CASE REPORTS

Case 1 A housewife of 40 entered the Massachusetts General Hospital on August 31, 1899, with a history of a sudden attack of crampy epigastric pain five days before entry. The pain was very severe and continued until the time of entrance, and was associated with vomiting of a considerable amount of dark-colored fluid. She stated that she had had three small bowel movements since the onset. On the day of entrance she felt more comfortable.

Examination showed an obese woman with a dry, black tongue and cold, clammy extremities. The abdomen was markedly distended with no localized tender

ness anywhere. The white blood cell count was 16,600, the temperature 101.5°F, the pulse rate 120 and the respirations 32. No x ray photographs were taken.

Operation was performed under ether anesthesia as soon as possible. The patient's condition was poor. A midline suprapubic incision was made, which was followed by evisceration of a large portion of the intestines. The obstruction was caused by a large, immovable gallstone with the wall of the bowel contracted about it. The exact point of obstruction could not be determined. The intestine was opened in two places by 1-cm incisions and a large amount of liquid fecal material was withdrawn. During this procedure salt solution was constantly passed over the intestines. The openings were closed with silk sutures following the removal of the gallstone. The wound was closed with through and through silk worm gut sutures. No effort was made to close the skin. The patient died shortly after the operation.

Case 2 A housewife of 71 entered the Massachusetts General Hospital on August 19, 1915, with a history of generalized abdominal pain and fecal vomiting for 2 days with no bowel movement for 3 days. She had been treated with brisk catharsis without either fecal or gas results.

Examination showed a very sick old woman who was unable to give her own history. The abdomen was distended and tender throughout, with visible peristalsis. It was tympanic except in the left flank. No masses or spasm could be elicited. The white-blood cell count was 11,000, the temperature 100.8°F, the pulse rate 118 and the respirations 24. No x ray photographs were taken.

Under novocain anesthesia, laparotomy was performed through a 10-cm incision just to the left of the midline. The large bowel and most of the small bowel were contracted. The stomach was markedly dilated. A large "fecalith" was found in the upper end of the jejunum. This was removed through a 5-cm incision, which was closed with a double row of Pagenstecher sutures. The abdominal wound was closed without drainage.

The patient was in very poor condition following operation. She died in 24 hours. An autopsy showed chronic pericholecystitis, with necrosis of the gall-bladder wall and the wall of the duodenum, wounds from operation for intestinal obstruction, due to a large concretion in the small intestine, probably a gallstone, arteriosclerosis chronic endocarditis of the mitral valve, slight, with stenosis hypertrophy and dilatation of the heart, hemorrhagic edema of the lungs, slight chronic pleuritis, left, carcinoma of the stomach, possibly originating in a congenital malformation of the nature of an accessory pancreas, scoliosis.

Case 3 A housewife of 46 entered the Massachusetts General Hospital on February 11, 1919, complaining of upper abdominal pain of 2 weeks duration. The pain was colicky and was associated with nausea and vomiting, which occurred ten or twelve times a day. Enemas produced both good fecal and gas results. On the morning of entrance the vomiting was fecal. The patient had had two similar though milder episodes 10 years and 1 year before entrance.

Examination showed a markedly obese woman, quite comatose. The patient had been given $\frac{1}{4}$ gr of morphine 2 hours before entry. The tongue was dry and red. The abdomen was tender throughout, with spasm in the right upper and lower quadrants. The left half of the abdomen showed no spasm. The white-blood cell count was 17,400, the temperature 97.6°F, the pulse rate 104 and the respirations 16. No x ray photographs were taken.

Laparotomy was performed shortly after admission. The bowel was adherent in the pelvis. No collapsed bowel was seen. There was dilatation of the large as well as of the small bowel. Owing to the patient's poor condition, further exploration was not done. The adhesions were freed and the patient was returned to the ward almost moribund. She died a few hours after operation. Autopsy showed the following: cholelithiasis, pericholecystitis, with necrosis of the gall bladder and the wall of the duodenum, occluding gallstone in the ileum, acute intestinal obstruction, slight fibrinous peritonitis, fatty metamorphosis of the liver, operation wound from laparotomy.

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Examination showed a moderately tense, considerably distended abdomen, with visible peristalsis. The white-blood cell count was not taken, the temperature was 97°F, the pulse rate 90 and the respirations 18. No x ray photographs were taken.

An immediate operation was done. There was considerable free turbid fluid in the peritoneal cavity. In the pelvis there were several loops of intestine covered with fibrin. A gallstone 4 by 2 by 2 cm., movable only with considerable difficulty, was found in the ileum. This was removed, and the incision was closed with a double layer of silk. Palpation of the gall bladder showed a mass of adhesions. A cigarette drain was placed in the pelvis.

The patient made an uneventful convalescence, and a year later reported that she had had no further trouble except for some pain in the lower end of the scar, where there was a definite hernial ring.

Case 5 A housewife of 70 entered the Massachusetts General Hospital on October 11, 1923, complaining of intermittent umbilical pain associated with vomiting of several weeks duration. There had been two or three attacks a week. Her bowels had moved every day following the use of cathartics.

Examination showed a general moderate tenderness throughout the abdomen, with only slight distention and occasional visible and audible peristalsis. The white-blood cell count was 22,400, the temperature 97°F, the pulse rate 120 and the respirations 20. No x ray photographs were taken.

Operation was performed through a left rectus incision and a gallstone measuring about 3 by 1.5 cm. was found impacted in the ileocecal valve. An attempt to force the stone through the valve was unsuccessful. It was removed through the terminal ileum, with closure of the incision by means of two rows of sutures, one of catgut and one of silk. Examination of the gall bladder area showed multiple adhesions. The abdomen was closed without drainage. There was considerable nausea and vomiting following the operation and there was infection of the wound. This gradually cleared up, and the patient was discharged 19 days after operation.

Two years later she re-entered the hospital with what appeared clinically to be carcinoma of the pancreas. This impression was confirmed at operation, when the gall bladder was found to be buried in adhesions which puckered the duodenum firmly to it. No biopsy was taken. The patient made a surprisingly uneventful convalescence.

and was relieved of her symptoms. The further course of this case is not known.

Case 6 A housewife of 75 entered the Massachusetts General Hospital on January 25, 1927, complaining of indigestion of 1 day's duration, associated with almost constant vomiting from onset to admission. This was accompanied by slight abdominal pain and cramplike pain in both lower extremities. Shortly before admission she noticed that the vomitus smelt like feces. This fact was confirmed at entrance. She had a small stool before entry.

Examination showed a soft, pendulous abdomen, not distended, without visible or audible peristalsis. The white-blood cell count was 24,000, the temperature 100°F, the pulse rate 110 and the respirations 24. No x ray photographs were taken.

Through a right rectus incision the abdomen was opened, and the entire small intestine was found to be dilated. The cecum was collapsed. A gallstone about 5 cm. in diameter was felt in the terminal ileum. This was removed, and the wound in the bowel was closed transversely.

Following operation, the patient took fluids poorly. Ten days after operation the wound broke down and drained profusely. This gradually cleared up with the use of Dakin's solution. The patient was discharged about 6 weeks after operation. A note some 5 months after operation stated that she was still weak and unable to report for any examination.

Case 7 A housewife of 67 entered the Massachusetts General Hospital on August 17, 1927, complaining of upper abdominal pain and vomiting of 5 days' duration. The vomiting was continuous and fecal. Her bowels had moved once since the onset of symptoms. The pain was generalized throughout the abdomen and very severe.

Examination showed generalized abdominal distention and tenderness without much spasm. There was no visible peristalsis but slight audible peristalsis over the left side of the abdomen. The white-blood cell count was not taken. The temperature was 99°F, and the respirations 30. No x ray photographs were taken.

Upon opening the abdomen through a right rectus incision, several loops of dilated small intestine were encountered. In the right lower quadrant the bowel was collapsed. A gallstone about 4 cm. in diameter was found in the lower ileum. The stone was removed, and the intestine was closed in two layers. An ileostomy was performed just above the line of suture.

The patient did fairly well for 24 hours after operation, when the pulse became elevated and signs of recurrent obstruction appeared. She died before any further operation could be done. No autopsy was done.

Case 8 A housewife of 59 entered the Massachusetts General Hospital on January 6, 1930, complaining of sharp mid-epigastric pain of 1 day's duration. For about 3 weeks prior to entry she had felt bloated after eating, but had had no pain. Her present attack was localized in the "pit of the stomach." She felt nauseated but did not vomit. There was no history of any previous gastrointestinal upset.

Examination showed a moderately distended abdomen without spasm but with a mild, diffuse tenderness around the umbilicus. Peristaltic sounds were scarce. She was admitted to the hospital for observation. The vomiting continued and became fecal, and was associated with an increase in abdominal distention and in audible peristalsis. The white-blood cell count was 15,750, the temperature

102°F, the pulse rate 100 and the respirations 24. A flat abdominal x ray plate showed no evidence of stone.

Operation was performed through a right rectus incision on the second day after admission. A gallstone about 2 cm. in diameter, faceted at either end and causing partial obstruction, was found in the ileum. This was removed through a longitudinal incision, which was closed transversely. No palpation of the gall-bladder area was done. A second smaller stone was palpated in the sigmoid and was delivered through the rectum.

The patient made an entirely uneventful convalescence, and 5 months later was entirely well with no symptoms. She was readmitted January 14, 1931, with acute cholecystitis. Four days after admission signs of peritonitis and pleurisy developed. Under novocain anesthesia a localized abscess was opened. She failed rapidly, dying 24 hours after operation. Autopsy showed the following: acute cholecystitis with perforation, general peritonitis, gall bladder-duodenum fistula, duodenal diverticulum, acute pleuritis, acute interstitial pancreatitis, obesity, arteriosclerosis, slight hypertrophy of the heart.

Case 9 An 80 year-old man was admitted to the Massachusetts General Hospital on October 17, 1930, complaining of abdominal pain associated with nausea and vomiting of 24 hours duration. The pain was sufficient to wake him up and had been increasing prior to entrance. It was localized mostly in the epigastrium. On entrance 37 oz of fecal matter was removed by gastric lavage.

Examination showed moderate tenderness without spasm in the epigastrium and along the course of the descending colon and cecum. The white blood count was not taken. The temperature was 99°F, the pulse rate 80 and the respirations 16. No x ray photographs were taken.

Laparotomy was performed through a right rectus incision. The small intestine was found to be dilated above a mass the size of a golf ball, which was situated 60 cm. from the ileocecal valve. A gallstone was removed, and the intestine was sutured in two layers longitudinally.

The patient was in poor condition throughout the operation, and died in 24 hours, apparently from uremia. Permission for an autopsy was not obtained.

Case 10 A housewife of 77 entered the Massachusetts General Hospital on November 3, 1932, complaining of vomiting and epigastric pain of 1 week's duration, not very severe but constant. After 3 days the pain had shifted to the right lower quadrant, where it persisted until entrance. The vomiting was almost constant for 3 days prior to entry. Her bowels had moved several times since the onset of the attack.

Examination showed an enormously distended abdomen, tympanic throughout, with slight tenderness and spasm in the right lower quadrant. The white blood count was 10,800, the temperature 99°F, the pulse 80 and the respirations 20. No x ray photographs were taken.

Laparotomy was performed through a midline incision. The ileum was dilated and covered with fibrin in the region of the appendix. The appendix, though covered with fibrin, was otherwise normal. A large gallstone about the size of a squash ball was removed from the terminal ileum, and an ileostomy was performed above the line of suture.

Following operation, the patient never regained consciousness and rapidly died. Autopsy showed the following: cholecystoduodenostomy, spontaneous, peritonitis, localized, bronchopneumonia, early, cardiac hypertrophy and dilatation, diverticula of duodenum and colon, arteriosclerosis, aortic, coronary and renal (marked) leiomyomas of the uterus, obesity.

Case 11 A housewife of 62 entered the Faulkner Hospital November 30, 1936, having been referred to me by Dr. Willis M. Stevenson of North Easton. Three days before entry she had complained of nausea and vomiting with a grumbling pain at the level of the umbilicus. This subsided so that she slept well the first night. The following day she was up and around, but vomited at intervals without recurrence of the pain. Her bowels moved twice on the day of onset but not since then, nor had she passed any gas by rectum. She had had a similar episode two years before, lasting for 4 or 5 days, with spontaneous remission. There had been no history of food idiosyncrasy.

Examination showed a well nourished woman, slightly obese, in no discomfort but considerably dehydrated. The abdomen was not distended. Peristalsis appeared to be normal. There was no localized tenderness anywhere in the abdomen. The white blood count was 17,000, the temperature 99.4°F, the pulse 87 and the respirations 20. She was given intravenous saline to replace the lost fluids, and the day after admission a flat abdominal x-ray plate was taken so that we could see whether there were any dilated loops of bowel. This plate showed a definitely calcified area on the left side of the pelvis, very suggestive of a gallstone. The patient continued to have nausea and occasional pain and was operated upon 2 days after admission. This was done through a right paramedian incision. There was a moderate amount of clear fluid in the peritoneal cavity. On the left side of the abdomen a large mass was felt. This proved to be bowel containing an impacted gallstone. The gallstone was removed, and the incision closed with two layers of catgut. The abdomen was closed without drainage. The gallstone weighed 20.3 gm. and measured 4 cm. in the largest diameter.

There was a slight infection of the subcutaneous fat. The patient was discharged in 2 weeks following the operation, taking nourishment satisfactorily. When seen 3 months after operation she felt entirely normal.

Case 12 A housewife of 70, who was operated on by Dr. F. G. Balch, Sr., and me, entered the Baker Memorial Hospital on November 26, 1932. She complained of severe, steady mid-abdominal pain of 3 days duration. It radiated over both upper quadrants into the front and back of the chest, but was not associated with nausea or vomiting. On the day of admission she became nauseated and vomited. The pain recurred with great intensity and required morphine for its control. Two years before she had complained of severe pain between the shoulder blades, not associated with nausea or vomiting but with severe jaundice. This subsided spontaneously in about 1 month. There was a recurrence of similar but milder symptoms 2 months later with spontaneous remission.

Examination showed a thin, undernourished woman with a faint icteric tinge to the skin. There was slight abdominal distention and no visible peristalsis. There was slight tenderness in the right upper quadrant. Audible peristalsis was somewhat increased. A flat abdominal plate showed a laminated calculus, presumably obstructing a loop of small bowel.

Laparotomy was performed through a right rectus incision. There was no free fluid in the peritoneal cavity. A mass about 4 cm. in diameter was felt in the terminal ileum. This proved to be a gallstone, which was removed, the incision being closed with a double layer of catgut. There was a dense mass of adhesions in the region of the gall bladder. The wound was closed without drainage.

The patient made an entirely uneventful convalescence.

Case 13 A housewife of 72 who was operated upon by Dr. E. L. Young, Jr., entered the Lawrence Memorial

Hospital on June 22, 1927, complaining of generalized abdominal pain associated with nausea and vomiting of 5 days duration. She had had bowel movements up to the night prior to entrance.

Examination showed a very sick looking old woman with a markedly distended abdomen and increased peristalsis. The vomitus was fecal. No white blood count was taken. The temperature was 98.6°F, the pulse 94 and the respirations 22.

Laparotomy was performed under novocain anesthesia. Satisfactory exploration was possible and revealed a mass about 7 by 4 cm. apparently in the ileum. A gallstone measuring 2 by 2 cm. was removed from the ileum, and the incision was closed with a double layer of catgut. The abdominal wound was closed without drainage.

She died about 48 hours after operation. Autopsy showed a fistula between the gall bladder and the duodenum.

Case 14 A housewife of 83 was referred to the Faulkner Hospital by Dr. D. L. Lionberger. She entered on September 24, 1936, complaining of vomiting of 6 days duration. At the onset of her illness she complained of upper abdominal, crampy pain associated with diarrhea, nausea and vomiting. The diarrhea and pain subsided, but the nausea and vomiting continued. She refused to enter the hospital until the 6th day of her illness.

Examination showed a feeble old woman with a dry mouth and tongue. The vomitus was definitely fecal. The nonprotein nitrogen was markedly elevated. The white blood count was 11,500, the temperature 98°F, the pulse 110 and the respirations 37. No definite diagnosis was made. The differential diagnosis lay between intestinal obstruction and uremia. The abdomen was not distended but high pitched peristalsis was audible. Her condition rapidly grew worse and she died 4 days after admission. Surgical exploration was not deemed advisable because of the patient's condition.

Autopsy showed a large, egg sized gallstone causing obstruction about 90 cm. above the ileocecal valve. There was a direct fistula between the gall bladder and the duodenum.

Case 15 A housewife of 67, who was operated upon by Dr. E. M. Daland, entered the Baker Memorial Hospital on April 12, 1934, complaining of pain in her stomach and vomiting of 10 days duration. Nine weeks before entry there had been a severe attack of epigastric pain and a feeling of substernal pressure. Since then there had been grumbling discomfort. Ten days before admission there was marked vomiting. Five days before admission the patient felt better, but the following day the pain became much more severe. Three days before entry an enema produced good fecal and gas results.

Examination showed a very much distended abdomen with tympany over the entire area. There was no tenderness or spasm. The white blood count was 12,900, the temperature 98°F, the pulse 80 and the respirations 20. An x-ray photograph taken on the day of admission suggested partial obstruction of the colon, probably in the region of the descending portion.

On the day of admission a laparotomy was performed under novocain anesthesia through a right muscle splitting incision. The cecum and small bowel were not particularly distended. A No. 30 catheter was sutured into the cecum.

The cecostomy did not function for 48 hours, but gas was passed following a rectal enema. One week after operation there was considerable increase in abdominal distention, and an ileostomy was performed. At that

time there was cloudy fluid in the abdominal cavity. The fluid showed colon bacilli on culture. The patient's condition gradually became worse and she died 12 days after admission. Autopsy showed the following: colloid adenocarcinoma of the gall bladder with metastases to mesenteric glands, cholecystoduodenal fistula, intestinal obstruction, gallstone in ileum, ulceration of jejunum and ileum, traumatic, with perforation and pelvic peritonitis, operative wounds from ileostomy and cecostomy, pulmonary embolism and infarction, renal infarction, thrombosis of suprarenal artery, polyposis of colon, arteriosclerosis, coronary and aortic, slight, pleuritis, chronic fibrous, bilateral, obesity.

Case 16 A housewife of 42, who was operated upon by Dr. H. H. Faxon, entered the Baker Memorial Hospital on July 13, 1931, complaining of abdominal pain of 3 days duration. Three nights before admission she suddenly had cramp-like, severe, non-radiating pain in the mid-epigastrium associated with nausea and vomiting. The severe pain persisted until entry, being localized a little more toward the umbilicus. Her bowels had moved with the help of saline cathartics until the day of entry. Two enemas on the morning of entrance produced no results. For 3 years she had had intermittent attacks of right upper-quadrant pain, radiating on one occasion to the back and associated with nausea and vomiting, but no jaundice.

Examination showed a rather obese middle-aged woman having attacks of cramp-like lower epigastric pain every 5 minutes which lasted about 1 minute. The abdomen was not distended. There was very slight tenderness in the gall bladder area. The white blood count was 17,000, the temperature 90°F, the pulse 90 and the respirations 21. As the patient was in fairly good condition, conservative treatment was decided upon. A few hours later she suddenly collapsed and was operated upon immediately.

Laparotomy was performed through a lower abdominal incision. A firm mass was felt in the ileum about 60 cm. from the ileocecal valve, it was round and about the size of a golf ball. The bowel was opened and a gallstone removed. The wound was closed without drainage.

The patient's condition was poor throughout the operation, and in spite of a transfusion she died a few hours following operation. No autopsy was done.

Case 17 A housewife of 78 who was operated upon by Dr. A. W. Allen entered the Baker Memorial Hospital on May 12, 1934. She had been known to have a gall bladder full of stones for about 9 years. Three days before admission she had severe right upper-quadrant discomfort, with radiation to the scapula, lasting for 20 minutes. The morning of entrance she complained of gas pains, which were not relieved by a normal bowel movement. About noon the pain became colicky in character and occurred every 5 minutes, lasting about 15 seconds at each attack. An enema gave no relief and caused no results. Nausea and vomiting continued throughout the day.

Examination showed tenderness on the left side of the abdomen near the umbilicus with slight spasm. The

white blood count was 11,000, the temperature 98°F, the pulse 88 and the respirations 16. Conservative treatment was advised. The day following admission, while in the x-ray department, she became nauseated but did not vomit.

An x-ray film taken 9 months before admission had shown two large gallstones in the right upper quadrant, while one taken on admission showed one gallstone in the gall-bladder area with another lying opposite the left ischial spine. An x-ray film taken 2 days after admission showed a moderately dilated loop of what appeared to be the jejunum extending down to the stone.

Two days after admission a laparotomy was performed through a left paramedian incision. The obstruction was about the size of a plum and was gently moved for 8 cm. in the intestine. The bowel was opened through a longitudinal incision, a gallstone was removed, and the bowel was sutured transversely. The abdomen was closed without drainage. The obstruction apparently occurred at the mid-ileum.

Following operation, the patient's temperature rose to 105°F and she showed signs of atelectasis. A transfusion was given, the patient's condition improved, and she was discharged relieved on June 9.

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MASSACHUSETTS MEDICAL SOCIETY

PROCEEDINGS OF THE COUNCIL

Stated Meeting, February 2, 1938

A STATED meeting of the Council was held in John Ware Hall, Boston Medical Library, 8 Fenway, Boston, on Wednesday, February 2, at 10.30 a m. The president, Dr Channing Frothingham, Suffolk, was in the chair, and 180 Councilors were present (Appendix No 1)

After the meeting was called to order by the President, he called upon the Secretary to present the record of the last meeting. The Secretary stated that the record of the meeting, held on October 6, 1937, was published in the *New England Journal of Medicine* for October 28, 1937. The President declared that, there being no objections, the report would be considered approved as published.

The President read the obituary of Dr John M Doran of Chelsea, a Councilor, who had died since the last meeting.

DR. JOHN MICHAEL DORAN died at the Chelsea Memorial Hospital, November 13, 1937. He was in his fifty third year.

After attending both Chelsea and Charlestown schools he received his degree from the Baltimore Medical College in 1907. He interned at the Maryland General Hospital.

Dr Doran was a member of the American Medical Association and of the Massachusetts Medical Society, being a member of the Council at the time of his death. He was president of the staff of the Chelsea Memorial Hospital.

His twin sons survive him.

Following the reading of the obituary the Council stood in silence in tribute to the memory of Dr Doran.

The Council voted to approve the report of the Auditing Committee as submitted by Dr Edmund H Robbins, Middlesex South (Appendix No 2).

Dr Charles S Butler proceeded to present the Treasurer's Report (Appendix No 3), which was accepted by vote.

REPORTS OF STANDING COMMITTEES

Membership and Finance

The report of the committee, as is customary, was divided into two parts, the first dealing with changes in membership (Appendix No 4). This report was adopted and the recommendations approved. The second part of the report (Appendix No 5) contained the recommendations for appropriations for the year 1938. The budget as submitted was approved by vote.

Arrangements

In the absence of the chairman, the report of the committee was read by the Secretary (Appendix

No 6). This report announced the dates of the 1938 annual meeting to be May 31, June 1 and June 2, at the Hotel Bradford in Boston. The report was accepted and the recommendations adopted.

Ethics and Discipline

The report of the committee was presented by the chairman, Dr David Cheever, Suffolk. In compliance with the vote of the Council, passed at the October meeting, the committee had given consideration to a complaint against Dr De Cesare, of Lawrence, for bringing suit against an officer and a fellow of the Society. Dr De Cesare had presented an apology, which was published in the *New England Journal of Medicine*, and an admonition was administered by the President. The committee reported that the case was closed. This recommendation of the committee was adopted by vote. Dr Cheever next presented a communication designed to express the attitude of the Society toward matters of publicity (Appendix No 7). It was voted to accept the report.

State and National Legislation

Dr Charles C Lund, Suffolk, presented the report of the committee. In connection with national affairs, he referred to a resolution introduced by Senator Lewis, of Illinois, in the spring of 1937. In effect this resolution would place all private practitioners of medicine in government employ. In accordance with the action taken by other state societies he then presented a resolution (Appendix No 8). Dr Lund presented a second resolution to be submitted to members of Congress and to the President of the United States (Appendix No 9). This resolution had to do with dangers to public health from poorly regulated manufacture of drugs, foods and cosmetics.

The *Legislative Bulletin* of the Society was presented, and the Council was asked to direct the committee in its attitude toward certain bills. First is the bill requiring annual registration of physicians (House Bill 41). It is felt that the bill is better drawn than previous ones, but the committee was not ready to take the responsibility of approving it. The second is House Bill 456, providing for a state fund to replace the present method of handling remuneration under the workmen's compensation law. The committee was in opposition to the bill but, since there might be members of the Council who felt that the bill

time there was cloudy fluid in the abdominal cavity. The fluid showed colon bacilli on culture. The patient's condition gradually became worse and she died 12 days after admission. Autopsy showed the following: colloid adenocarcinoma of the gall bladder with metastases to mesenteric glands, cholecystoduodenal fistula, intestinal obstruction, gallstone in ileum, ulceration of jejunum and ileum, traumatic, with perforation and pelvic peritonitis, operative wounds from ileostomy and cecostomy, pulmonary embolism and infarction, renal infarction, thrombosis of suprarenal artery, polyposis of colon, arteriosclerosis, coronary and aortic, slight, pleuritis, chronic fibrous, bilateral, obesity.

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his opinion he considered it his duty to make the nominations. It was moved and seconded to rescind the vote passed by the Council in 1902. The President asked the vice-president, Dr Phippen, to take the chair and the discussion proceeded. Dr Mongan, Middlesex South, quoted from a letter sent to one of the members by the Secretary of the American Medical Association which read as follows:

Delegates of the several states are elected to the House of Delegates by the constituent state medical association in accordance with the specific provisions of the by-laws of those organizations. I think it is quite possible that the actual details of the election of delegates are not altogether similar in the various states, but no one has any voice in the selection of delegates other than the members or proper official bodies of the state associations.

Dr Frothingham asked that the quotation from the letter be published since it appeared to indicate that different states select their delegates in different ways. After more discussion, with numerous Councilors taking part, the motion was lost by a standing vote of 40 favoring and 92 opposed.

The President then resumed the chair. He proceeded to announce nominations and, when an attempt was made to make nominations from the floor, he stated that he could not go against the previous action of the Council and that he did not see how it was possible to have nominations from the floor.

Dr Blaisdell, Middlesex East, appealed from the ruling of the chair. Dr Cheever, Suffolk, pointed out that the regulations and laws, under which the Society is enacted, are the by-laws and that these by-laws were passed in 1934. While admitting that, as a matter of procedure, the privilege had been accorded to the President to make nominations, it did not in the least preclude the right of the Council to make nominations from the floor. Dr Frothingham suggested that, if the procedure had been in error, the Council should correct it but that, until the vote directing the President to make nominations had been rescinded, the Council should adhere to that method. Finally, Dr Blaisdell's appeal from the ruling of the chair was brought up for vote and the Council ruled the chair to be in error.

Dr Joslin, Suffolk, moved and it was seconded that the Council reconsider its previous action relative to the precedent established in 1902. Dr Frothingham once more asked Dr Phippen to the chair. After still further discussion, on standing vote, it was found that 92 had voted to repeal the previous action of the Council in 1902 and 33 voted against such repeal. On resuming the chair Dr Frothingham stated that progress had been made, and that

since he believed that the Council now wanted nominations for delegates to be made from the floor he withdrew the nominations he previously made. There was some objection but he insisted. Nominations then proceeded as follows:

Charles E. Mongan (Middlesex South)
Elmer S. Bagnall (Essex North)
David D. Scannell (Norfolk)
Michael A. Tighe (Middlesex North)
Arthur W. Marsh (Worcester)
John I. B. Vail (Barnstable)
Walter G. Phippen (Essex South)
Dwight O. Hara (Middlesex South)

It was voted that the nominations be closed. It was next voted to proceed to elect by ballot. Drs Blaisdell, Lionberger, Homans and Ellison were appointed as tellers. The chair appointed the secretary, Dr Begg, to act as referee and umpire. The Council adjourned for luncheon from 2.00 to 2.30 p.m.

Upon resumption of the session the President called upon the Secretary to announce the count which was as follows:

Charles E. Mongan	77
Elmer S. Bagnall	62
Arthur W. Marsh	58
David D. Scannell	83
Michael A. Tighe	55
John I. B. Vail	21
Walter G. Phippen	71
Dwight O. Hara	81

It was declared that Drs Scannell, O'Hara, Mongan and Phippen had been elected as delegates. Dr Charles C. Lund nominated the other four men for election as alternates with the understanding that the individual receiving the highest number of votes in this group of four be alternate for the delegate receiving the highest number of votes, and the others to follow in a similar order. Dr Lund's motion was carried and it was declared that Drs Bagnall, Marsh, Tighe and Vail had been selected as alternates.

The Council voted to confirm the nominations of the President and to appoint delegates to the annual meetings of the adjoining New England societies as follows:

Maine Frank W. Snow (Essex North)
William D. Walker (Essex North)
New Hampshire Daniel J. Ellison (Middlesex North)
Henry F. Dearborn (Essex North)
Vermont Thomas F. Corriden (Hampshire)
James W. Bunce (Berkshire)
Rhode Island Marshall N. Fulton (Norfolk)
David D. Pratt (Bristol South)
Connecticut Clarence E. Burt (Bristol South)
Theodore L. Story (Worcester)

would be in the interest of the public, a discussion was requested. The third bill, House Bill 1298, requires the licensing of all hospitals. Some changes had been suggested. The matter was presented to the Council for discussion. House Bill 1409 is an act to regulate the selling of medicines which contain enough poison or deadly drug to kill a person if taken in whole or in part. There seemed to be so many complications which might arise, should such a bill pass, that the committee sought guidance. He then proceeded to discuss other bills which were included in the *Legislative Bulletin*. The Council voted to accept the report of the committee and proceeded to take up the various recommendations for action. It was voted to approve of the resolutions submitted by the committee (Appendices No 8 and 9). It was voted not to support House Bill 41. It was voted to oppose House Bill 456. After considerable discussion of House Bill 1298, the Council voted to oppose the bill as drawn. House Bill 1409 was discussed in considerable detail, and it was finally voted not to favor this bill. Following the disposition of the committee's report, the chairman called attention to the long list of bills on medical matters which were before the Legislature this year. He asked the support of the Society for the committee.

Public Health

Dr Robert B Osgood, Suffolk, presented the report of the committee (Appendix No 10). After some discussion as to the possibility of preserving the anonymity of the physicians giving broadcasts, it was finally voted to accept the report.

Medical Defense

Dr Franklin G Balch, Norfolk, presented the report of the committee (Appendix No 11). The committee raised the question as to whether the Society should continue to offer medical defense for its members since, in the majority of instances, physicians already carry malpractice-defense insurance. The Council voted to accept the report.

Permanent Home

The report of the committee was accepted as presented by the chairman, Dr William H Robey, Suffolk (Appendix No 12). Dr Robey then took occasion to refer to a matter not directly concerned with his report. He stated that the donor of the six hundred dollars would probably like to have his name withheld. Dr Robey felt that the Council would like to know that the giver was Dr Walter P Bowers.

There was a vote of appreciation

REPORTS OF SPECIAL COMMITTEES

Cancer

The report of the committee, as presented by Dr Truesdale, Bristol South, was accepted (Appendix No 13).

Postgraduate Instruction

The report of the committee, as presented by the chairman, Dr Ober, Suffolk, was accepted by vote (Appendix No 14). The recommendation that the committee be continued and directed to co-operate with government agencies in carrying out the present plan of postgraduate instruction was adopted.

Public Relations

The report of the committee was presented by the secretary, Dr Bagnall, Essex North (Appendix No 15). It was voted to accept the report.

Miscellaneous

The committee appointed to consider the boundaries of the district societies reported through its chairman, Dr John M Birnie, Hampden. The report was adopted (Appendix No 16).

The committees previously appointed to consider restoration to the privileges of fellowship recommend such restoration under the usual conditions, except as noted in certain cases (Appendix No 17). The action recommended was approved by the Council.

APPOINTMENT OF NEW COMMITTEES

The Council approved of the appointment of new committees to consider petitions for restoration to the privileges of fellowship (Appendix No 18).

The chair announced the appointment of a committee to co-operate with the advisory committee of the State Commissioner of Health to help determine policies in regard to work on gonorrhea and syphilis. The committee consists of Drs Peer P Johnson, Roy J Ward and Alfred L Duncombe. The Council voted to approve the nominations.

APPOINTMENT OF DELEGATES

The President stated that the next business was the appointment of delegates and alternates to the American Medical Association. After some discussion Dr Frothingham explained that, at the February meeting of the Council in 1902, it was voted that delegates to the House of Delegates of the American Medical Association should be appointed by the Council on nomination of the President. The by-laws do not contain the specific vote passed at that time, but the procedure has always been the same with perhaps one exception when a delegate was nominated from the floor. In

A. R. Gardner
F. P. Murphy
T. A. Stamas
M. A. Tighe

C. S. Adams
D. J. Bailey
R. L. Cook
W. G. Curtis

MIDDLESEX SOUTH

F. R. Jouett
C. F. Atwood
E. W. Barron
G. F. H. Bowers
B. F. Conley
D. F. Cummings
H. F. Day
A. W. Dudley
H. G. Giddings
H. W. Godfrey
W. G. Grandison
A. D. Guthrie
F. A. Higginbotham
N. M. Hunter
A. M. Jackson
A. A. Levi
F. P. Lowry
F. F. McGurr
J. A. McLean
Edward Mellus
C. E. Mongan
J. P. Nelligan
E. J. O'Brien, Jr.
Dwight O'Hara
Max Ritvo
E. S. A. Robinson
M. J. Schlesinger
E. F. Sewall
E. W. Small
H. P. Stevens
R. A. Taylor
H. W. Thayer
Fresenius Van Nuy
M. W. White
W. S. Whittemore

NORFOLK

Frederick Reis
F. G. Balch
A. S. Begg
M. G. Berlin
M. I. Berman
D. N. Blakely
Myrtelle M. Canavan
F. S. Cruickshank
D. G. Eldridge
H. M. Emmons
C. B. Faunce, Jr.
L. M. Freedman
Maurice Gerstein
W. A. Griffin
J. B. Hall
H. L. Johnson
E. L. Kickham
H. M. Landesman
D. L. Lionberger
F. P. McCarthy
M. V. Safford
D. D. Scannell
F. J. Simmonds
J. W. Tiede

NORFOLK SOUTH

N. R. Pillsbury

PLYMOUTH

L. A. Alley
Jacob Brenner
W. H. Pulsifer

SUFFOLK

Conrad Wesselhoeft
W. B. Breed
C. S. Butler
David Cheever
Lincoln Davis
R. L. DeNormandie
G. B. Fenwick
Reginald Fitz
Channing Frothingham
John Homans
Rudolph Jacoby
E. P. Joslin
T. H. Lanman
R. I. Lee
C. C. Lund
L. S. McInturck
W. J. Mixter
J. P. Monks
N. A. Nelson
R. N. Nye
F. W. O'Brien
J. P. O'Hare
R. B. Osgood
L. E. Parkins
L. E. Phaneuf
Helen S. Pittman
W. H. Robey
R. M. Smith
M. C. Sosman
E. F. Timmins
I. J. Walker
C. F. Wilinsky

WORCESTER

J. C. Austin
W. P. Bowers
L. R. Bragg
G. A. Dix
E. B. Emerson
G. E. Emery
J. M. Fallon
E. L. Hunt
E. R. Leeb
W. F. Lynch
A. W. Marsh
E. C. Miller
W. C. Seelye
R. J. Ward
F. H. Washburn
R. P. Watkins

WORCESTER NORTH

T. R. Donovan
E. A. Adams
H. C. Arey
A. F. Lowell
F. M. McMurray
H. R. Nye

APPENDIX NO. 2

REPORT OF THE AUDITING COMMITTEE

The Auditing Committee has required an audit of the books of the Treasurer by a certified public accountant. The committee reports that the certified public accountant examined the securities in the care of the Treasurer and found such to be correct.

EDMUND H. ROBBINS,
JOHN B. THOMES

Hartshorn and Walter
Certified Public Accountants
50 Congress Street
Boston

January 26, 1938

The Auditing Committee

Dr. Edmund H. Robbins and Dr. John B. Thomes
The Massachusetts Medical Society
Boston, Massachusetts

Gentlemen

At the request of your treasurer, Dr. Charles S. Butler, we have examined the books and accounts of the Massachusetts Medical Society for the twelve months ended December 31, 1937, and submit herewith

Schedule A Statement showing the balance sheet of the Massachusetts Medical Society, December 31, 1937

Schedule B Statement showing the revenue and expenses of the Massachusetts Medical Society for the twelve months ended December 31, 1937

The cash on deposit in the banks has been reconciled with the bank statements and found correct.

The cash receipts as recorded have been properly accounted for and disbursements are supported by vouchers or canceled checks which were examined by us.

The securities and savings bank books in the various funds were examined by us.

The accompanying balance sheet and related statement of revenue and expenses fairly present its position at December 31, 1937, and results of its operations for the year.

Respectfully submitted,
HARTSHORN AND WALTER.

SCHEDULE A

STATEMENT SHOWING THE BALANCE SHEET OF MASSACHUSETTS MEDICAL SOCIETY
DECEMBER 31, 1937

ASSETS		
<i>Fund Securities and Cash</i>		
Endowment Funds	\$22,166.57	
Building Fund	60,261.40	
General Fund	98,730.43	
Total		\$181,158.40
FUND ACCOUNTS		
<i>Endowment Funds</i>		
Shattuck Fund		
G. C. Shattuck 1854-1866	\$9,166.57	
Phillips Fund		
Jonathan Phillips 1860	10,000.00	
Cotting Fund		
B. E. Cotting \$1,000.00 1876-1881 1887	3,000.00	
Building Fund		22,166.57
		60,261.40

Dr Alexander S Begg was nominated for appointment as delegate to the Annual Congress on Medical Education and Licensure of the American Medical Association to be held at the Palmer House, Chicago, February 14 and 15, 1938. The nomination was confirmed and he was duly elected by vote.

INCIDENTAL BUSINESS

The Secretary presented a list of applicants for fellowship which had been received too late for publication prior to the meeting of the Boards of Censors on November 4, 1937. These individuals were admitted to the examination and were tentatively passed. The Council voted to approve the action taken and to declare these physicians fellows of the Massachusetts Medical Society.

The Secretary presented a change in the by-laws, proposed by Dr Reginald Fitz, chairman of the Committee on Medical Education and Medical Diplomas. This amendment was based upon a resolution adopted at the annual meeting on recommendation of Dr Levi, Middlesex South (Appendix No 19). These changes were presented for information of the Council. The regular procedure for their presentation to the annual meeting will be followed.

The President presented another proposed change in the by-laws designed to divide the work of the Committee on Membership and Finance and to create a new committee which will deal entirely with budget and financial planning (Appendix No 20). Upon being duly moved and seconded it was voted to recommend these changes in the by-laws for adoption by the Society at its annual meeting in June, 1938.

On motion of Dr Walter P Bowers, Worcester, the Council voted as follows:

The Council of the Massachusetts Medical Society, representing over five thousand physicians in the State, in the regular appointed meeting of this second day of February, 1938, hereby records its endorsement of the administration of the Massachusetts Department of Public Health under the direction of the Commissioner of Public Health, Dr Henry D Chadwick. And further that the President and Secretary of the Massachusetts Medical Society are hereby authorized to assure His Excellency, Governor Hurley, that, under the continued service of Dr Chadwick in the position now held by him, the Commonwealth will maintain its generally accorded high standing in the public health administration of the several states of the Union.

The Secretary presented a petition from physicians on Martha's Vineyard requesting that there be established a separate district society on the Island of Martha's Vineyard. The Council voted to refer the communication to Dr Birnie's committee, previously appointed to consider boundaries of district societies.

The Council, after discussion, voted "that a committee of five most recent presidents of the Massachusetts Medical Society be appointed to consider suitable changes in the by-laws which will clarify the method by which delegates to the House of Delegates of the American Medical Association shall be chosen."

Dr Halbert G Stetson, Franklin, reported that he had attended the annual meeting of the Vermont State Medical Society, held in St Johnsbury, Vermont, last fall. It was a two-day meeting, full of enthusiasm and with evidence of hospitality to the delegates. He stated that an excellent program had been prepared.

The Secretary announced that Dr Francis E O'Brien had resigned as secretary of the Hampshire District Medical Society and that Dr Joseph D Collins had been elected to fill the vacancy.

The Council voted to postpone discussion of the subject which has come to be known as "Principles and Proposals."

The meeting adjourned at 3:05 p m.

ALEXANDER S BEGG, *Secretary*

APPENDIX NO 1

ATTENDANCE

BARNSTABLE	ESSEX SOUTH
M E. Champion	J F Donaldson
S M Beale, Jr	B B Mansfield
J I B Vail	A E Parkhurst
	W G Phippen
BERKSHIRE	J W Trask
I S F Dodd	FRANKLIN
Solomon Schwager	H G Stetson
P J Sullivan	A H Wright
BRISTOL NORTH	HAMPDEN
H L Rich	F H Allen
W H Allen	T S Bacon
A R Crandell	E P Bagg, Jr
F V Murphy	J M Birnie
BRISTOL SOUTH	W A R Chapin
Henry Wardle	J L Chereskin
G W Blood	P E Gear
R B Butler	Frederic Hagler
E D Gardner	E A Knowlton
H E Perry	M W Pearson
ESSEX NORTH	G L Steele
W D Walker	MIDDLESEX EAST
E S Bagnall	L M Crosby
R V Baketel	J H Blaisdell
C S Benson	Richard Dutton
J F Burnham	E M Halligan
Z W Colson	J H Kerrigan
H F Dearborn	K L MacLachlan
H R Kurth	R R Stratton
L C Pearce	E E Tyzzer
G L Richardson	MIDDLESEX NORTH
F W Snow	F D Lambert
C F Warren	M L Alling

3 000 U S. Cold Storage Co 1st Mtg R. E. Gold 6s Jan 1 1945	3 000 00	140 00
2,000 U S. Rubber Co 1st & Ref. 5s Jan 1 1947	1 735 50	100 00
2,200 U S. A. Treasury 3 1/4s Oct 15 1945-43	2 700 00	21 49
7 000 U S. A. Treasury 2 1/4s June 15 1935	2 000 00	57 50
2 000 U S. A. Treasury 3 1/4s Aug 15 1941	2 000 00	65 00
1 000 U S. A. Treasury 3 1/4s Oct 15 1945-43	1 015 00	32 44
2,000 U S. A. Treasury 3 1/4s Oct 15 1945-43	2 0 6 25	65 07
1 000 U S. A. Treasury 1 1/4s Series A Mar 15 1941	1 000 00	15 00
— U S. A. Treasury 3s Feb. 15 1937		30 00
3 000 U S. A. Treasury 1 1/4s Series A Mar 15 1942	3 003 44	13 00
1 000 Virginian Ry. Co. 1st & Ref. Mtg. Series A 3 1/4s Mar 1 1966	1 022.50	37.50
1 000 Western Mass. Co 3 1/4s Note due June 15 1946	1 012.50	32.50
3 000 Wilson Co Inc Series A 1st Mtg 4s July 15 1955	3 000.00	120 00
— New England Journal of Medicine	1 00	
Totals	\$93 730 48	\$3 474 03
Less, — Bond Premiums Charged Off		157.96
Net Income.		\$3,316 07

BUILDING FUND

DECEMBER 31 1937

Balance, January 1 1937		~57,951
Additions:		
Income from Securities	\$1 813 82	
Gift received from Dr. Bowers	600 00	
Total Additions		2 413 82
Total		\$60,364 82
Deduction:		
Bond Premiums Charged Off		103 60
Balance, December 31 1937		\$60,261 22

SCHEDULE B

STATEMENT SHOWING THE REVENUE AND EXPENSES OF THE MASSACHUSETTS
MEDICAL SOCIETY FOR THE TWELVE MONTHS ENDED
DECEMBER 31 1937

REVENUE

<i>Assessments Received by District Treasurers</i>		
Barnstable	\$480 00	
Berkshire	1 180 00	
Bristol North	670 00	
Bristol South	1,976 00	
Essex North	1 790 00	
Essex South	2,650 00	
Franklin	380 00	
Hampden	3 010 00	
Hampshire	610 00	
Middlesex East	1 070 00	
Middlesex North	1 150 00	
Middlesex South	8 731 00	
Norfolk	7 450.52	
Norfolk South	1,210 00	
Plymouth	1 742 00	
Suffolk	7 411 00	
Worcester	4 005 00	
Worcester North	1 050 00	
		\$40,295.52
<i>Assessments Received by Treasurer</i>		1 455.50
<i>Non Resident Assessments</i>		1 434 00
<i>Sale of Directories and History</i>		62 64
<i>Committee of Arrangements—Annual Meeting</i>		119 33
<i>Income from Funds</i>		
Endowment Funds	\$649 17	
General Fund	3,316.07	
		3,965.24
<i>Profit on Sales of Securities</i>		149.50
Total Revenue		\$53 454.53

EXPENSES

<i>Salaries</i>		
Secretary	\$3 000 00	
Treasurer	1 000 00	
Executive Assistant	1 666 66	
Editor Emeritus of Journal	1 200 00	
		\$6 866.66
<i>Expenses of Officers and Delegates</i>		
President	\$52.89	
Secretary	1 616.24	
Treasurer	397 01	
District Treasurers	2,629 16	
Censors	513 00	
Delegates to American Medical Association	367.34	
		5 595 64

General Expenses

Maintenance of Society Headquarters (including clerical and other ex penses)	\$4 171 80	
Shattuck Lecture	200 00	
Cotting Luncheons	284 00	
Committee Expenses		
State and National Legisla tion	\$481 47	
Public Health	10 67	
Medical Education and Diplomas	100.33	
Membership and Finance	16 45	
Ethics and Discipline	36.04	
Obstetrics and Gynecology	72.40	
Public Relations	1,558.27	
		2,275 63
Miscellaneous expenses	71.55	
		6,952.56
Refunds to District Societies		5 000 00
<i>Standing Committees</i>		
Publications		
A. New England Journal of Medicine	\$70,500 00	
B. Annual Directory	2 145 66	
		\$22 645 66
Medical Defense	1 454 60	
Committee on Postgraduate Instruction	766.67	
		24 866.93
Total Expenses		49,582.09

Unexpended Revenue

\$3,502.44

APPENDIX NO 3

REPORT OF THE TREASURER

The past year, 1937, has been a year of advance for the Society in financial affairs. But there have been problems to meet, and the Treasurer has had one problem, in particular that of investing available funds. Interest rates have continued low, offerings of high grade securities, fitted for funds of the Society, have commanded such high prices and yielded such low income returns (as less than 3 per cent for long term bonds), that the Treasurer thought it advisable, from time to time, to buy short-term paper, to carry along, until the future seemed more certain. This practice has, of course, reduced somewhat the income but has protected the principal of the Society's funds.

The Treasurer would again state his opinion, covering the policy of investment to be followed. Because funds of the Society are, in his opinion, funds IN TRUST, they should be invested with consideration, first, of safety of principal. They should not be put in common stocks, which fluctuate widely. It is unnecessary to recall to mind what happened to common stocks in 1929 to 1932, nor to point to the last four months of 1937, when most common stocks, even the best, dropped 40 per cent in price, and many others, dropped from 50 to 70 per cent. For this Society, the Treasurer believes that a moderate, dependable income, with reasonable safety of principal, is the wiser course.

The revenues, in 1937, from annual resident dues, amounted to \$47,754, the largest amount ever received from this source. Nonresident dues amounted to \$1,434 additional, so that the total received was \$49,188.

Income received from invested funds of \$3,965.24 from sales \$62.64, and profit \$149.50—together \$4,177 18—make a combined revenue of \$53,365.20 an increase over 1936, and the largest total annual revenues ever received by the Society.

The Building Fund has been increased by two items first, an annual return of \$1,710 from investments, and secondly, a very generous gift, from Dr. Walter P. Bowers, of \$600. You can probably realize the thrill experienced by the Treasurer when this gift was received. It is a wonderful example of devotion and loyalty to the Society.

General Fund

Balance, January 1 1937	\$94 828 04
Add — Unexpended revenue for the twelve months ended December 31 1937	3 902 44

Balance December 31 1937 98 730 48

Total \$181 158 75

ENDOWMENT FUNDS

DECEMBER 31 1937

	Securities and Cash	Income
Shattuck Fund		
Annuity Policy — Massachusetts Hospital Life Insurance Co	\$9 166 87	\$229 17
Phillips Fund		
\$10 000 Commonwealth of Massachusetts 3½s Jan. 1 1944 (Reg.)	10 000 00	350 00
Cotting Fund		
Deposit — Institution for Savings in Roxbury	1 000 00	22.50
Deposit — Provident Institution for Savings Boston	1 000 00	25 00
Deposit — Suffolk Savings Bank Boston	1 000 00	22 50
Totals	\$22 166 87	\$649 17

BUILDING FUND

DECEMBER 31 1937

	Securities and Cash	Income	Premium Charged Off
Cash New England Trust Co	\$5 286 96		
Deposit Framingham National Bank Savings Department	351.56	\$8 59	
Deposit Franklin Savings Bank	1 735 63	42.59	
\$1 000 American Tel. & Tel. Co. Deb 3½s Oct. 1 1961	972.50	13 09	
1 000 Blackstone Valley Gas & Electric First Mtge. & Coll. Trust 4s Series C Nov. 1 1965	1 025 00	40 00	
1 000 Boston & Albany R. R. First Mtge. Series A 4½s April 1 1943 (Guaranteed)	967 50	45 00	
Canadian National Ry. Equip. Series L 1930 4½s June 1 1937		22 50	10 00
5 000 Conveyancers Title Insurance & Mortgage Co. 4½s Part. Mtge. Oct. 31 1939 (In default)	5 000 00		
5 000 C/D Chicago R. 1 & Pacific Ry. 1st Ref. 4s April 1 1934 (In default)	4 735 00		
1 000 Cincinnati Union Terminal First Mtge. Series C 5s May 1 1957 (Guaranteed)	1 000 00	50 00	
1 000 City of Buffalo N. Y. 4 20% Sept. 1 1939	1 030 00	42 00	10 00
City of Cleveland 4½s Sept. 1 1937		45 00	42.50
1 000 City of Fitchburg Mass. 4s Aug. 1 1939 (Reg.)	1 027.50	40 00	9 00
1 000 City of Pittsburgh Pa. 3½s April 1 1939	1 020 00	32 50	10 00
1 000 City of St. Paul Minn. 4s Feb. 1 1939	1 010 00	40 00	6 00
City of Newburyport Mass. 2s Nov. 1 1937		20 00	1.50
1 000 City of Quincy Mass. 3½s May 1 1943	1 016 00	35 00	4 00
1 000 Commonwealth of Massachusetts 3s July 1 1939 (Reg.)	1 020 00	30 00	10 50
1 000 Connecticut River Power Co. 3½s Feb. 15 1961	1 045 00	37.50	
1 000 General Motors Accept. Corp. 3½s Aug. 1 1951	1 015 00	32 50	
1 000 Kansas City Mo. 4½s Dec. 1 1945	1 040 00	42.50	
2 000 N. Y. Central R. R. S. F. Sec. 3½s April 1 1946	1 960 00	75 00	
1,500 N. Y. Chicago & St. Louis Ry. Notes 6s Oct. 1 1938	1,500 00	90 00	
1 000 Southern Bell Tel. & Tel. Co. Deb 3½s Apr. 1 1962	965 00	12 55	
2 000 Standard Oil Co. of N. J. Deb 3s June 1 1961	1 960 00	60 00	
500 Swampscott, Mass. Series D 3½s Sept. 1 1942	533 75	17 50	
1 000 U. S. A. Treasury Note Series A 1½s Mar. 15 1941	1 000 00	15 00	
2 000 Virginian Ry. Co. 1st & Ref. Mtge. A 3½s Mar. 1 1966	2 045 00	75 00	
Boston Medical Library Note 4½s due Apr. 1 1938	20 000 00	850 00	
Gift received from Dr. Bowers		600 00	
Totals	\$60 261 40	\$2,413 82	\$103 50
Less — Bond Premiums Charged Off		103 50	
		\$2,310.32	

NOTE: The Net Income from Building Fund amounting to \$2,310.32 has been transferred to Building Fund Principal

GENERAL FUND

DECEMBER 31 1937

	Securities and Cash	Income	Premium Charged Off
Cash Merchants National Bank	\$10 297.36		
Cash New England Trust Co	3 832.68		
Deposit Franklin Savings Bank Boston	1 074.48	\$26 86	
\$2 000 American Tel. & Tel. Co. Deb 3½s Dec. 1 1966	2,040 00	65.00	
3 000 Appalachian Elec. Power 1st & Ref 5s May 1 1956	2,910 00	150.00	
2 000 Bethlehem Steel Corp. S. F. Series E 3½s Oct. 1 1966	1 970 00	75.00	
1 000 Blackstone Valley Gas & Elec. Co. Coll. Trust Mtge. Series C 4s Nov. 1 1965	1 025 00	40.00	
2 000 Boston & Albany R. R. 1st 4½s Apr. 1 1943 (Guaranteed)	1,935 00	90 00	
1 000 Canadian Natl. Ry. Equip. Series J 4½s May 1 1938 (Guaranteed)	1 027 00	45 08	10.00
1 000 Canadian Natl. Ry. Equip. Series J 4½s May 1 1939 (Guaranteed)	1 045.25	45 00	15.00
2 000 Cedars Rapids Mfg. & Power Co. 1st Mtge. 5s Jan. 1 1953	1 870 00	100 00	
3 000 Central Power & Light Co. 1st 5s Aug. 1 1956	2,730 00	150 00	
1 000 Chesapeake & Ohio Equip. Tr. Series V 5s July 1 1938	1 026.52	10 56*	
— City of Brockton \$5 000 60% Dec. 9 1937		12.42	
1 000 City of Buffalo Ref. 4 20% Sept. 1 1939	1 025 00	42.00	10 00
2 000 City of Buffalo 2 60% July 1 1939	2 025 00	52 00	15 00
— City of Cambridge 3½s Dec. 1 1937		113 00	7 45
— City of Malden \$5 000 65% Nov. 15 1937		24.38	
— City of Medford \$5 000 60% Nov. 10 1937		8.33	
— City of Newburyport \$5 000 60% Nov. 5 1937		22.50	
— City of St. Paul 4s Feb. 28 1937		26.11	21.50
— Commonwealth of Australia 5s July 15 1955		101 67	
1 000 Commonwealth of Mass. 3½s Jan. 1 1938 (Reg.)	1 010 00	12.83	11.51
3 000 Commonwealth of Mass. 3½s July 1 1938 (Reg.)	3 010 00	105 00	
1 000 Commonwealth of Mass. 3½s July 1 1940 (Reg.)	1 055 00	35.00	
1 000 Commonwealth of Mass. 3½s Jan. 1 1941 (Reg.)	1 000 00	35.00	
1 000 Connecticut River Power Co. 1st 3½s Series A Feb. 15 1961	1 045 00	37 00	
2 000 Conveyancers Title Insurance & Mortgage Co. 4½s Dec. 1 1937 (In default)	2 000 00		
1 000 Erie County 4s Oct. 15 1938	1 030 00	40 00	15 00
1 000 General Motors Accept. Corp. 3½s Aug. 1 1951	1 015 00	32.50	
1 000 General Motors Accept. Corp. 3s Aug. 1 1946	1 015 00	30 00	
1 000 Georgia Power Co. 1st Ref. 5s Mar. 1 1967	862 50	50 00	
3 000 International Paper Co. Ref. Series A 6s Mar. 1 1955	3 076 00	180 00	
2 000 Great Northern Ry. Co. Gen. Mtge. B 5½s Jan. 1 1952	1 932.50	110 00	
1 000 Great Northern Ry. Co. Gen. Mtge. Gold Series A 3½s Jan. 1 1967	975 00	15 62	
1 000 Jones & Laughlin Steel Co. 1st Mtge. Series A 4½s Mar. 1 1961	9,00 00	42.50	
1 000 Koppers Gas & Coke Co. 1st & Coll. Trust Series A 4s Nov. 1 1951	1 000 00	40 00	
— Maine Central Equip. 5½s June 1 1937		27 50	30 00
2 000 Metropolitan Ice Co. 1st Mtge. Series A 7s Jan. 1 1954	1 100 00	140.00	22.00
— Minneapolis 4s July 1 1937		40 00	
1 890 National Bondholders Corp. Partic. Cert. Guarantee Title & Trust Co. 1 Reg. (In default)	1 890 00		
1 000 N. Y. Central R. R. S. F. 3½s Series C Apr. 1 1946 (Secured)	980 00	37.50	
1 000 N. Y. Chicago & St. Louis Ry. Co. 1st Mtge. 3½s extended to Oct. 1 1947	937.50	2 72*	
750 N. Y. Chicago & St. Louis R.R. 6% Notes Oct. 1 1938	750 00	45.00	
2 000 Ohio Edison Co. 1st Mtge. 4s Sept. 1 1967	1 010 00	8.00*	
1 000 Peoples Gas Light & Coke Co. 1st & Ref. Series D 4s June 1 1961	975 00	40 00	
1 000 Public Service Co. of No. Ill. 4½s July 1 1960 1st Lien & Ref. Series I	1 000 00	45.00	
4 000 Public Service Co. of No. Ill. 1st & Ref. 5s Oct. 1 1956	3 640 00	200 00	
2 000 So. Pacific (Ore. Lines) 1st Mtge. Series A 4½s Mar. 1 1977	1 605 00	90 00	
1 000 Texas Corp. 3½s Deb. June 15 1951	1 000 00	35.00	
2 000 Tidewater Assoc. Oil Co. S. F. Deb 3½s Jan. 1 1952	1 997.50	21 00	

Interest paid out.

Cohen, Archibald Clinton, White Haven, Penn
 Durgin, Edward Chase, Marshfield.
 Eaton, Charles Alexander, Boston
 Hanlon, Joseph Peter, Hudson
 Hitchcock, James, Mason, N. H., with remission of dues, 1937

King, Marjorie Clara Meehan, Princeton, N. J.
 Sheffner, Sidney Alexander, Los Angeles, Calif
 Spink, Wesley William, Minneapolis, Minn
 Weymouth, Currier Clyde, Farmington, Maine, with remission of dues, 1935, 1936, 1937
 Whitman, Luther Oakes, Randall, Minn

4 That the following named twenty-eight fellows be deprived of the privileges of fellowship under the provisions of Chapter I, Section 8, Clauses (a) and (b) of the by laws

Berenson, Wyman, Mattapan.
 Chapman, Lillian Dobson, Boston.
 Cox, Oscar Francis, Brookline.
 Donovan, Paul Royal, Revere.
 Heffernan, Dennis William, Framingham.
 Hubbard, Elizabeth Wright, New York City
 Hymen, Max Henry, Lowell.
 Lalime, George Louis, Tewksbury
 Langlois, William Edward, Worcester
 Larsson, Johan Gustave, Boston.
 Lavine, George Robert, Rochester, N. Y.
 Lemire, Joseph Edward, Worcester
 Lyons, George Henry, Roslindale.
 MacLeod, Harry Found, East Milton
 Markham, Erwin Walter, Great Barrington.
 McLaughlin, Hugh Joseph, Caldwell, Idaho
 McSheehy, Theobald Coleman, Worcester
 Mitchell, William, Needham Heights.
 Murphy, Joseph William Patrick, Peabody
 Record, Myles Standish, Abington.
 Rifkin, Abraham, Brockton.
 Ruggles, Roger Lee, Westfield.
 Shaw, Arthur Briggs, Longview, Washington.
 Sweeney, John Gerard, Hingham.
 Thompson, Richard Henry, Center Sandwich, N. H.
 Tierney, Edward James, Dorchester
 Tosney, Harold John, Bellwood, Ill.
 Vaccaro, Francis Joseph, Pittsfield.

5 That the following named seventeen fellows be allowed to change their membership from one district society to another without change of legal residence, under the provisions of Chapter III, Section 3, of the by laws

From Middlesex South to Essex North

Abrams, Jacob Irving, Newton Center

From Middlesex South to Suffolk

Albright, Hollis Ludlow, Newton Highlands
 Aub, Joseph Charles, Belmont.
 Clifford, Milton Henry, Cambridge
 Marks, Joseph Henry, Newton.
 Miner, Leroy Matthew Simpson, Newtonville.
 Mintz, Emanuel Ross, Newton.

From Middlesex South to Worcester

Bray, Thomas Ambrose, Holliston.

From Norfolk to Suffolk

Arkin, Louis, Sharon.
 Callanan, Eugene Francis, Dorchester
 Dunphy, Edwin Blakeslee, Brookline.
 Green, Robert Montraville, Brookline
 Ham, Thomas Hale, Brookline.

Lehnherr, Earl Rudolph, Brookline.
 Painter, Charles Fairbank, Brookline.
 Short, Charles Lyman, Brookline

From Norfolk to Middlesex South

Schlosberg, Charles, Brookline.

DAVID N. BLAKELY, *Chairman*

APPENDIX NO 5

REPORT OF COMMITTEE ON MEMBERSHIP AND FINANCE, ON FINANCE, BUDGET FOR 1938

	Recommended for 1938	Appropriated in 1937
Salaries		
Secretary	\$3 000	\$3 000
Treasurer	1 000	1 000
Executive assistant	2,000	1 500
Editor of <i>Journal</i> emeritus	1 200	1 700
	<hr/> \$7 200	<hr/> \$6 700
Expenses of officers and delegates		
President and vice president	\$500	\$500
Secretary	1 600	1,200
Treasurer	400	400
District treasurers	2 600	2,400
Censors	8.5	800
Delegates to House of Delegates American Medical Association	2,300	500
	<hr/> 8 225	<hr/> 5 800
Maintenance society headquarters including clerical and other expenses	5 000	5 000
Shattuck Lecture	200	200
Cotting Luncheons	350	300
Standing committees.		
Arrangements	\$1 000	\$2 000
Publications		
A <i>New England Journal of Medicine</i>	21,500	22,800
B <i>Annual Directory</i>	2,000	2 000
Membership and Finance	25	25
Ethics and Discipline	50	100
Medical Education and Medical		
Diplomas	200	200
State and National Legislation	2 000	2 000
Public Health	100	100
Malpractice Defense	2 000	2 000
	<hr/> 29 275	<hr/> 31 225
Special Committees		
Postgraduate Instruction	\$1 000	\$1 000
Public Relations	1 000	2 000
Cancer		200
Section of Obstetrics and Gynecology	250	
Boston Better Business Bureau		25
	<hr/> 2 250	<hr/> 3,225
Returns to district societies	4 000	5 000
Total	<hr/> \$56,500	<hr/> \$57 450

*Including expenses of delegate to annual congress at Chicago and prize offered to interns in Massachusetts

†Including expenses of delegate to annual congress at Chicago

APPENDIX NO 6

REPORT OF THE COMMITTEE OF ARRANGEMENTS

The 1938 annual meeting will be held May 31, June 1 and 2, at the Hotel Bradford in Boston. The second day, June 1, will be given over to a combined clinical meeting along the lines of the one which proved so successful last year. Every effort is being made to secure outstanding speakers for this program and to offer to members a morning and afternoon of unusual interest. The various section meetings will be held on the first and third days.

Through planned economy in recent years, the Committee of Arrangements has been able to run the annual meetings at a nominal cost to the Society. This year, we are asking for an appropriation of only one thousand dollars in contrast to twice that amount appropriated by the Council in the past few years.

WALTER S. BURRAGE *Chairman*

Total expenses, during 1937, have increased over \$2000. The expense of publishing an annual directory, a practice begun in 1911, has increased over 1936. The expense to the Society of the *New England Journal of Medicine*, as was expected from the Treasurer's report for 1936, shows an increase, and other expense accounts show increases. Expenses of the Committee on Public Relations also shows considerable increase over 1936. In connection with expenses, the Treasurer urges more careful conformity to budget allotments. The Society has a yearly budget, and the budget should be considered, and not overspent.

A pleasant result of 1937 is that of the Committee of Arrangements. The Council, in 1937, appropriated \$2000 to cover necessary or unforeseen demands for expenses of the annual meeting. With careful supervision of expenses, and larger revenue from commercial booths, this committee turned over to the Treasurer a balance of \$119.33. It is the first time, the Treasurer believes, this result has been accomplished, and shows good management. The Treasurer appreciates the co-operation of that committee, under the guidance of Dr. Rogers.

The Society ended 1937 with unexpended revenue of \$3,902.44. Total assets of the Society now amount to \$181,158, an increase for the year of over \$6,000.

The Treasurer takes this opportunity to thank the officers of the Society and the district officers for their co-operation, and especially thanks the staff of the *New England Journal of Medicine*.

CHARLES S. BUTLER, *Treasurer*

THE MASSACHUSETTS MEDICAL SOCIETY

TREASURER'S RESUME OF FINANCES FOR CALENDAR YEAR 1937, IN COMPARISON WITH YEAR 1936

DISBURSEMENTS

SALARIES

	1936	1937
Secretary	\$3 000 00	\$3 000 00
Treasurer	1 000 00	1 000 00
Executive Assistant	1 316 67	1 666 66
Editor Emeritus of Journal	—	1 200 00

EXPENSES OF OFFICERS AND DELEGATES

President	120.36	52.89
Secretary	1 112.06	1 616.24
Treasurer	445.37	397.01
District Treasurers	2 315.08	2 629.16
Censors	681.00	813.00
Delegates to American Medical Association	681.26	387.34

GENERAL EXPENSES

Maintenance of Society Headquarters	3,959.70	4 171.88
Shattuck Lecturer	200.00	200.00
Cotting Luncheons	283.00	284.00

COMMITTEE EXPENSES

Of Arrangements Annual Meeting	1 157.43	—
Publications		
A <i>New England Journal of Medicine</i>	17 500.00	20 500.00
B Annual Directory	1,920.62	2 145.66
Membership and Finance	10.25	16.45
Ethics and Discipline	50.62	36.04
Medical Education and Diplomas	109.37	100.33
State and National Legislation	1 993.44	481.47
Public Health	21.87	10.67
Medical Defense	2 172.00	1 454.60
Public Relations	889.75	1,558.27
Postgraduate Medical Instruction	753.51	766.67

SPECIAL APPROPRIATIONS

Attorney Expense, re Dr. De Cesare suit	350.00	—
Contribution to Boston Better Business Bureau	25.00	25.00
Surety Bond District Treasurer (one)	6.25	6.25
Section of Obstetrics and Gynecology	89.50	22.40
Expense of Joint Meeting	78.74	—
Refund to District Societies	5 000.00	5 000.00
Miscellaneous	—	40.10
Unexpended Balance	5,395.50	3 902.44
	\$52 638.35	\$53 484.53

REVENUES

	1936	1937
Assessments		
Paid to District Treasurers	\$43 886.50	\$46 295.52
Paid to Treasurer	2 486.28	1 458.50
Paid by Non Resident Fellows	1 495.00	1 434.00
Sales of Directory and History	48.40	62.64
Shattuck Fund	275.01	229.17
Phillips Fund	350.00	350.00
Cotting Fund	75.00	70.00
General Fund	3,377.53	3,316.07
Profit	644.63	149.30
Revenue, over expenses of annual meeting June 1937	—	119.33
Total Revenues	\$52 638.35	\$53 484.53

FOR COMPARISON

COST OF ANNUAL DIRECTORY OF FELLOWS

1932	1933	1934	1935	1936	1937
\$1 935	\$1 637	\$1 864	\$1 947	\$1,920	\$2 145

APPENDIX NO 4

REPORT OF THE COMMITTEE ON MEMBERSHIP AND FINANCE, ON MEMBERSHIP

This committee recommends

1 That the following named twenty-two fellows be allowed to retire as of December 31, 1937, under the provisions of Chapter I, Section 5, of the by laws

Ash, John Henry, Quincy
Bartlett, Oliver Leslie, Pittsfield
Beals, Arthur Loring, Brockton
Blenkhorn, James, Stoneham.
Blodgett, Stephen Haskell, South Lincoln.
Bowen, John Templeton, Boston
Burnett, Frank Hollis, Brockton
Francis, Carlton Shurtleff, Brookline.
Gates, Ernest A., Springfield.
Howe, Oliver Hunt, Cohasset.
Kellogg, Frederic Leroy, Boston, with remission of dues, 1935, 1936, 1937

King, Frederick Augustine, Marshfield.
Lawrence, Joseph Henry, Brockton
Pierce, Helen Frances, Plymouth
Robertson, Ewan Alexander, West Newton.
Rockwell, John Arnold, Cambridge.
Rolfe, William Alfred, Boston
Schmidt, Frederick Sextus, Roxbury
Stone, Ella Gertrude, Boston.
Thompson, Clara Louise Hunt, Boston
Tryon, Geneva, Boston.
Ussher, Clarence Douglas, Worcester

2 That dues of the following named five fellows be remitted under the provisions of Chapter I, Section 6, of the by laws

Borden, Charles Richardson Cobb, Brookline, 1938
Cabitt, Henry Leo, Brookline, 1936, 1937
Dunscombe, William Colby, Ensenada, Porto Rico, 1937 (in part), 1938
Hamilton, Robert Delaney, Newburyport, 1938
Wilder, Edward Wheeler, Madura, South India, 1938

3 That the following named twelve fellows be allowed to resign as of December 31, 1937, under the provisions of Chapter I, Section 7, of the by laws

Beckner-Otis, Clara Lee, Brea, California.
Byrnes, John Peter, Springfield, with remission of dues, 1935, 1936, 1937

Cohen, Archibald Clinton, White Haven, Penn
 Durgin, Edward Chase, Marshfield.
 Eaton, Charles Alexander, Boston
 Hanlon, Joseph Peter, Hudson
 Hitchcock, James, Mason, N H., with renuission of dues,
 1937

King, Marjorie Clara Meehan, Princeton, N J
 Sheffner, Sidney Alexander, Los Angeles, Calif
 Spink, Wesley William, Minneapolis, Minn
 Weymouth, Currier Clyde, Farmington, Maine, with re
 mission of dues, 1935, 1936, 1937
 Whitman, Luther Oakes, Randall, Minn

4 That the following named twenty-eight fellows be
 deprived of the privileges of fellowship under the provi
 sions of Chapter 1, Section 8, Clauses (a) and (b) of the
 by laws

Berenson, Wyman, Mattapan.
 Chapman, Lillian Dobson, Boston
 Cox, Oscar Francis, Brookline.
 Donovan, Paul Royal, Revere.
 Heffernan, Dennis William, Framingham
 Hubbard, Elizabeth Wright, New York City
 Hymen, Max Henry, Lowell
 Lalume, George Louis, Tewksbury
 Langlois, William Edward, Worcester
 Larsson, Johan Gustave, Boston.
 Lavine, George Robert, Rochester, N Y
 Lemure, Joseph Edward, Worcester
 Lyons, George Henry, Roslindale.
 MacLeod, Harry Found, East Milton.
 Markham, Erwin Walter, Great Barrington.
 McLaughlin, Hugh Joseph, Caldwell, Idaho
 McSheehy, Theobald Coleman, Worcester
 Mitchell, William, Needham Heights
 Murphy, Joseph William Patrick, Peabody
 Record, Myles Standish, Abington.
 Ruffin, Abraham, Brockton
 Ruggles, Roger Lee, Westfield.
 Shaw, Arthur Briggs, Longview, Washington.
 Sweeney, John Gerard, Hingham.
 Thompson, Richard Henry, Center Sandwich, N H
 Tierney, Edward James, Dorchester
 Tosney, Harold John, Bellwood, Ill.
 Vaccaro, Francis Joseph, Pittsfield

5 That the following named seventeen fellows be al
 lowed to change their membership from one district so
 ciety to another without change of legal residence, under
 the provisions of Chapter III, Section 3, of the by laws

From Middlesex South to Essex North

Abrams, Jacob Irving, Newton Center

From Middlesex South to Suffolk

Albright, Hollis Ludlow, Newton Highlands
 Aub, Joseph Charles, Belmont.
 Clifford, Milton Henry, Cambridge.
 Marks, Joseph Henry, Newton.
 Miner, Leroy Matthew Simpson, Newtonville.
 Mintz, Emanuel Ross, Newton.

From Middlesex South to Worcester

Bray, Thomas Ambrose, Holliston.

From Norfolk to Suffolk

Arkin, Louis, Sharon
 Callanan, Eugene Francis, Dorchester
 Dunphy, Edwin Blakeslee, Brookline.
 Green, Robert Montraville, Brookline
 Ham, Thomas Hale, Brookline.

Lehnerr, Earl Rudolph, Brookline.
 Painter, Charles Fairbank, Brookline.
 Short, Charles Lyman, Brookline.

From Norfolk to Middlesex South

Schlosberg, Charles, Brookline

DAVID N BLAKELY, *Chairman*

APPENDIX NO 5

REPORT OF COMMITTEE ON MEMBERSHIP AND FINANCE, ON FINANCE, BUDGET FOR 1938

	Recommended for 1938	Appropriated in 1937
Salaries		
Secretary	\$3 000	\$3 000
Treasurer	1 000	1 000
Executive assistant	2 000	1 500
Editor of <i>Journal</i> emeritus	1 200	1 700
	\$7 200	\$6 700
Expenses of officers and delegates		
President and vice president	\$500	\$500
Secretary	1 600	1 700
Treasurer	400	400
District treasurers	2,600	2,400
Censors	8.5	800
Delegates to House of Delegates American Medical Association	2,300	500
	8,225	5 800
Maintenance society headquarters in cluding clerical and other ex penses	5 000	5 000
Shattuck Lecture	200	200
Cutting Luncheons	350	300
Standing committees		
Arrangements	\$1 000	\$2 000
Publications		
<i>A New England Journal of Medicine</i>	21 500	22,800
<i>B Annual Directory</i>	2,400	2 000
Membership and Finance	25	25
Ethics and Discipline	50	100
Medical Education and Medical Diplomas	200	200
†State and National Legislation	2 000	2 000
Public Health	100	100
Malpractice Defense	2 000	2 000
	29 275	31 225
Special Committees		
Postgraduate Instruction	\$1 000	\$1 000
Public Relations	1 000	2 000
Cancer		200
Section of Obstetrics and Gynecology	250	
Boston Better Business Bureau		25
	2,250	3,225
Returns to district societies	4 000	5 000
Total	\$56,500	\$57 450

Including expenses of delegate to annual congress at Chicago and prize
 offered to interns in Massachusetts

†Including expenses of delegate to annual congress at Chicago

APPENDIX NO 6

REPORT OF THE COMMITTEE OF ARRANGEMENTS

The 1938 annual meeting will be held May 31, June 1
 and 2, at the Hotel Bradford in Boston. The second day,
 June 1, will be given over to a combined clinical meeting
 along the lines of the one which proved so successful
 last year. Every effort is being made to secure outstand
 ing speakers for this program and to offer to members a
 morning and afternoon of unusual interest. The various
 section meetings will be held on the first and third days.

Through planned economy in recent years, the Com
 mittee of Arrangements has been able to run the annual
 meetings at a nominal cost to the Society. This year, we
 are asking for an appropriation of only one thousand dol
 lars in contrast to twice that amount appropriated by the
 Council in the past few years.

WALTER S BURRAGE *Chairman*

APPENDIX NO 7

GENERAL PRINCIPLES GOVERNING PUBLICITY

The distinction between medicine as a liberal, scientific, altruistic profession, and vocations based on industry and commerce has always been jealously maintained by physicians. In this connection, advertising—one of the chief foundations of competitive business—is not employed by physicians, since it tends to lower the dignity of the profession and to give a false idea of values and thus impairs the usefulness of the profession to the public. In the past, the sole approved way for physicians to make themselves and their qualifications known was by joining medical societies and taking part in their activities, writing for medical journals, and establishing a reputation which spread in a natural way among the laity. They were denied the usual avenues of publicity open to business men.

These principles are as sound today as ever before. New conditions affecting all mankind, especially the vast development of more effective means of communication by press, radio and film, and new concepts of the desirability of informing and educating the public on matters formerly considered to lie within the sphere of interest of a small class only, are profoundly affecting the status of the physician, with the result that he must participate in these activities. Such participation is fraught with the possibilities of abuse which may harm the profession. Publicity and educational propaganda actively carried on by physicians must be regulated with care by organized medicine. The following code is suggested for adoption by the Massachusetts Medical Society for the guidance of its fellows, officers and standing committees to enable them to protect its standards.

As a preamble it may be stated that now as always, the best way to impress the public with the value of scientific medicine is for every practitioner to make himself competent, conscientious and sympathetic in carrying out his professional duties. If every layman could have frequent personal relations with such a physician most of the problems concerning the medical care and education of the public would cease to exist.

Every form of publicity and propaganda in which physicians engage must have for its sole object the benefit of the public through education. If its effect is to aggrandize and advertise the merits of an individual physician or group of physicians, it is objectionable and contrary to the spirit of the Code of Ethics of the Massachusetts Medical Society. If such aggrandizement and advertisement are inevitable and unavoidable incidents in securing an important educational advantage to the public, they should be reduced to an absolute minimum and the burden of proof that they are in fact necessary must rest on the physician involved.

Educational propaganda should be, if possible, under the name of a physician who is not engaged in active private practice in competition with his fellows. Thus officials of boards of health, full time teachers in medical schools or duly appointed committees of the Society or of its component district societies constitute the most appropriate agents, who are understood to be acting under the aegis of such institutions. Certain institutions such as hospitals which function as community health centers not conducted for profit, or bona fide educational organizations not conducted for profit, may sponsor propaganda, but physicians who act for them should conform to the above types.

It is recognized that under certain circumstances, which

it is believed will be exceptional, a physician engaged in private practice may be the most available person to convey necessary or useful information to the public. If so, it is highly desirable that the subject covered in his address or paper should not be identical with his own field of practice. If such identity cannot be avoided, it is essential that no reference be made to his own experience, accomplishments or peculiar abilities, to the number of his patients or the success of his treatment. The pronouns of the first person—"I," "me," "my," "we," "us," and "our"—should be conspicuous by their absence. Introductions of a speaker on the radio or platform should consist merely of his name, if that be required, and only such additional words as are necessary to identify him. All laudatory comments on him or his work should be avoided or reduced to a minimum. Observance of the canons of good taste will be most helpful to the reputation of the profession.

The acceptance by a practicing physician of employment by a commercial organization to give a radio address, even though it be on public health matters rather than on the merits of the product manufactured or distributed by the concern, is not permissible. Such an association between physician and business cannot fail to cause one to be identified with the other, and to make the public believe that the physician and therefore his profession endorse the product. Such an activity cannot be considered as bona fide altruistic education of the public.

The petty publicity conferred by the daily press on certain physicians—mention of their activities, of their prominent patients and their progress, of their acquisition of new apparatus and kindred bits of news—constitutes an advertisement—usually unsought but sometimes not discouraged by the victims. It is recognized that the intensive news gathering and lack of respect for personal privacy which characterize the modern era make some of this publicity practically unavoidable, but the physician who abhors it and meets its temptations with dignity and firmness is not likely to be subject to the criticism of his fellows on the score of advertising.

All communications by private physicians—on the air or platform or in the lay press—which could possibly be regarded as of doubtful propriety on the ground of unethical publicity should be submitted for approval before hand to the appropriate officers of the Massachusetts Medical Society.

In formulating, for the guidance of our fellows, this code of behavior, it is the intention of this committee that our Society maintain the essentials of those traditional concepts of behavior which should be fundamental and unchanging, and at the same time recognize the changed and still changing conditions of modern life and encourage wise and reasonable adjustments to them. It is believed that an attitude which promotes the reputation of the physician as a high minded, unselfish humanitarian ensures the best service to the public.

APPENDIX NO 8

RESOLUTION ON FEDERALIZATION OF MEDICAL PROFESSION

WHEREAS, Senate Joint Resolution 188, introduced on July 28, 1937, in the Senate of the United States by Senator J. Hamilton Lewis, of Illinois, proposes to federalize the medical profession of the nation, making every licensed physician and surgeon a civil officer and subject to prose

cution and penalization in the federal courts for special causes enumerated in the resolution, and

WHEREAS Such action being clearly a case of class legislation is contrary to the principles of constitutional government, and

WHEREAS, The obligation imposed by the Joint Resolution upon each licensed physician of rendering needed medical service to any and all impoverished who make application to him would inevitably overwhelm practitioners of outstanding reputation, create the necessity of elaborate machinery to determine who would qualify as impoverished or in lieu thereof open the way for fraudulent practices, political interference and tend to lower the standards of medical practice, and

WHEREAS, The authority reposed by the Joint Resolution in the Social Security Board would lead almost certainly to fee fixing by governmental agencies and would necessitate a nation wide accounting and investigating system that would add a tremendous indirect cost to the nation's bill for medical care and

WHEREAS, The penalties imposed by the Joint Resolution on persons who violate the provisions thereof are so exorbitantly severe as to create a detrimental and inimical psychology in the medical profession, and

WHEREAS, The proposed plan would lend itself easily to political abuse and become a stepping stone to communistic and socialistic government, and

WHEREAS, Poverty itself is the fundamental cause of most of the ills which the Joint Resolution seeks to cure and prevent through the superficiality of a superimposed medical service, and

WHEREAS, The enforcement of local laws already on the statute books would provide as adequately for the sick poor as modern facilities and circumstances make practicable, and

WHEREAS, The needy now enjoy as adequate medical care as economic limitations and the vagaries of human nature would make possible under the proposed plan therefore, be it

RESOLVED BY THE COUNCIL OF THE MASSACHUSETTS MEDICAL SOCIETY IN REGULAR SESSION ASSEMBLED, That Senate Joint Resolution 188 is inimical to the best public interests, is un-American and unworkable, would result in monumental expenses without yielding compensating benefits, would lead to political corruption and tyranny and ought to be defeated, and, be it further

RESOLVED, That copies of these resolutions be forwarded to the President of the United States, to each senator and representative in Congress from Massachusetts and to the secretaries of the medical societies of the several states

APPENDIX NO 9

RESOLUTION ON FOODS, DRUGS AND COSMETICS

WHEREAS, The existing federal laws and regulations governing the manufacture and sale of drugs, foods and cosmetics are insufficient to protect the public from serious harm and even death, and

WHEREAS, The recent investigations of the United States Department of Agriculture show conclusively the need for further and more stringent action therefore be it

RESOLVED, That the Massachusetts Medical Society through its Council urgently petitions the President of the United States and Congress in support of such legislation and respectfully urges that the enforcement of the laws and

the regulations issued under such authority should be vested in the Division of Food and Drugs Administration in the Department of Agriculture.

RESOLVED, That copies of these resolutions be forwarded to the President of the United States, to each senator and representative in Congress from Massachusetts and to the secretaries of the medical societies of the several states.

APPENDIX NO 10

REPORT OF THE COMMITTEE ON PUBLIC HEALTH

The Committee on Public Health and the Subcommittee on Public Education beg leave to submit the following report

The Committee on Public Health has succeeded in obtaining the co-operation of the Massachusetts Central Health Council in helping to carry out the vote of the Council passed at its meeting in April, 1935, to encourage the formation of community health centers in various districts throughout the State under the initiative of the different district societies wherever the provision for more adequate medical care seems to be desirable and likely to be favored by such action.

The Massachusetts Central Health Council is a voluntary association of sixteen existing private and public agencies concerned directly or indirectly with health. Its purpose is to co-ordinate these activities, thereby eliminating duplication of effort and increasing efficiency.

At a meeting of the Central Health Council held on December 3, 1937, on motion of Dr. Richard M. Smith, one of the representatives of the Massachusetts Medical Society on the Central Health Council, it was voted to appoint a committee to meet with representatives of the Committee on Public Relations of the Massachusetts Medical Society to discuss with them the ways and means by which the Massachusetts Central Health Council might be of service in the establishment and conduct of any such community health centers. This committee of the Massachusetts Central Health Council was given power to act for the Council. There is no suggestion that such co-operation involves any measure of control of these district health centers, which in the opinion of the Committee on Public Health, should be both initiated and managed by representatives of the district societies. The committee urges the district societies to explore the need for a community health center in their own localities and to familiarize themselves with the investigations of Dr. Ernest L. Hunt in the Worcester district and with the plan which he and his co-workers have proposed to meet the demonstrated need in their district. The Public Relations Committee voted on June 2, 1937, to invite the Worcester District Medical Society to proceed with the establishment of such a community health center.

The activities of the Subcommittee on Public Education have centered about the radio broadcasts sponsored by the Massachusetts Medical Society and the State Department of Public Health.

The committee hopes that the fellows of the society are listening in to these broadcasts on Wednesday evenings at 7.30 over Station WAAB. Thus far, with the exception of less than a dozen addressed postal cards asking for comments and suggestions, fifty of which were distributed at the last meeting of the Council to fellows who expressed willingness to listen in and mail their suggestions, no comments have been received by the secretary of the subcommittee, Dr. Gerald N. Hoeftel, 319 Longwood Avenue, Boston. A very considerable and gratifying amount of fan mail asking for copies of the differ-

ent broadcasts has been received, which suggests that the public are finding these broadcasts interesting and helpful. Through the co-operation of the State Department of Public Health, it has been possible to mail mimeographed copies of the desired broadcasts to all who have asked for them. With this co-operation of the State Department of Public Health only a minimum expense to the Society has been incurred.

The Subcommittee on Public Education takes this opportunity of warmly thanking the eminent fellows of the society who have given their time and thought to the preparation of these broadcasts and have been so willing to accept the suggestions of the subcommittee as to the content and form of presentation of these broadcasts. The committee also expresses its gratitude to the *New England Journal of Medicine* which receives copies of all broadcasts for the publication of those which in the opinion of the editorial board are of value to the profession.

The committee has been asked for its opinion upon a matter which seems to it to be of considerable importance. A fellow of the society who had been broadcasting on medical subjects under his own name for a non-medical educational institution sought the advice of the officers of the society as to the ethics of the procedure. The matter was referred to the Subcommittee on Public Education, which interviewed said fellow, reviewed several broadcasts that he had already delivered and was proposing to deliver. The material for the most part was innocuous and contained little which could be construed as self-advertisement. Nevertheless, realizing that the practice involved a matter of principle, he was advised to desist from further broadcasting of this kind at least until an opinion from the Committee on Ethics and Discipline could be obtained. This he agreed to do. The whole matter was then referred to the Committee on Ethics and Discipline for complete review.

The New York Academy of Medicine and the New York County Medical Society have been faced by similar situations and after careful consideration have published a brochure entitled, "Principles Governing Contact of Physicians with the Public Through the Press, Lecture Platform, Lay Periodicals and Radio, by which medical men in that locality have been made aware of the opinion of the Academy and the County Society as to the ethics of public medical education in relation to addresses and broadcasts. It seems to be a most useful guide.

The Subcommittee on Public Education has been informed that the Committee on Ethics and Discipline has undertaken the task of drawing up such a guide for the Massachusetts Medical Society, copies of which are to be sent to each member of the Society for comment. It is expected that the final recommendations of the Committee on Ethics and Discipline will be presented for action by the Council at the next annual meeting.

ROBERT B OSGOOD *Chairman*
GERALD N HOEFFEL *Secretary*

APPENDIX NO 11

REPORT OF THE COMMITTEE ON MEDICAL DEFENSE

Though the Committee on Medical Defense has no definite report to make at this meeting, I do want to say a few words on the general subject of defense of malpractice suits.

We have requests on the average of three a year, and I find that our expenses are running close to the two-thousand-dollar limit. Rarely one of these men sued has never thought it necessary, on account of the practice he

was in, to carry any kind of insurance, such men include those in state positions, house officers, and so forth. These men I think we should defend but it worries me to carry some of the cases which apply for help. They seem to me an unnecessary tax upon the more provident members of the Society who carry their own insurance.

Insurance now costs little and malpractice defense does not seem to me a necessary duty of the Society except in certain cases. The committee should be kept in existence and perhaps take care of the defense of members for good reason only on a vote of the whole committee instead of just the chairman and secretary.

When the committee was founded, it was expected that it would carry out various functions which it never has. It was supposed to prevent suits by going to the parties and talking to each side. Under the old Medical Defense Act it said "It shall study and report upon the underlying causes of the growth in the number of suits for malpractice, and it shall exert, so far as possible, its influence to check this growth. In specific instances it shall take counsel with both plaintiff and defendant in threatened suits. It shall report to the Committee on Ethics and Discipline any instance coming to its knowledge wherein a fellow, in connection with a suit for malpractice, has violated the Code of Ethics of the Society." * * * * I consulted with one of the most prominent judges of the superior court in Massachusetts who informed me that I should find myself in trouble very promptly if I tried to prevent men from testifying or in other ways interfered with the carrying out of the law. Consequently, that section had to be dropped. I have personally always felt that a man had a right to testify either for the plaintiff or defendant and that if he told the truth, it was none of our business whether he testified. Where complaints have been brought about testimony given by doctors in court, I have if possible obtained a transcript of the testimony. Unfortunately, the worst evidence that has been given has been given by out-of-state men, and we have no way of controlling them. I have taken it up in some instances with the secretaries of the state societies, but they have not been particularly co-operative. I think the knowledge that their testimony would be examined has had the effect of making some rather flagrant offenders careful in the way they testify, and for the last few years I have had no complaints about unfair testimony.

I believe that the fact that the Society pays no verdicts even if one is given against a doctor tends to lessen the number of suits very materially, and to that extent it certainly is useful. Of course the policies in the various commercial companies read in these days that the company shall not compromise a suit except with the written permission of the defendant. Doctors hate being sued and will do anything to get a case finished up. They are therefore not very loath to let a company settle a suit since they themselves do not have to pay for it and can thereby get the trouble off their minds. I am perfectly convinced that if every suit were fought, it would reduce litigation very materially. Again, if the doctor himself in every case had to pay the verdict, patients would often be very slow about suing.

Taking it altogether, I think the Society's defense of suits has certain very worth while aspects for both those who are sued and those who are not. On the other hand it seems very expensive and perhaps some way could be devised to reduce the costs. The one thing we certainly do not want to do is to employ any second rate lawyers. In all the time I have been connected with the committee, Mr. Dodge's firm has won, or had put aside, all but two suits. In one of these we were beaten before we started

and had advised the man to compromise. He had no money to do it. In another suit we lost because the doctor became very apprehensive and said he wanted the suit settled at any cost. Under the new Medical Defense Act, we can no longer tell a doctor whom he shall employ to defend him if we are to pay for the suit, and I think this may lead to complications. Perhaps by the June meeting we will have some definite recommendations to make as to whether the Society should continue to insure its members. I am gradually becoming convinced that that is not a necessary function of the Society.

FRANKLIN G. BALCH, *Chairman*

APPENDIX NO 12

REPORT OF THE COMMITTEE ON PERMANENT HOME

The Building Fund of the Massachusetts Medical Society, which is managed by the Committee on Permanent Home, showed on December 31, 1936, a book value of \$57,951.07 compared with the present book value of \$60,261.40, an increase of \$2,310.32 for the year 1937. The income from the Fund in 1937 came from two sources: (1) interest from investments of \$1,710.32 and (2) a gift of \$600 from Dr. Walter P. Bowers. There is also a note of \$20,000 unsecured with interest at 4½ per cent, of the Boston Medical Library but this note has not been reduced by any payment on principal in 1937.

I have had several conferences with Dr. Butler, our treasurer, who has given me the figures already stated. I have not called a meeting of our committee because it appears that while we might buy a suitable piece of property, at the present time none is located in a desirable part of the city for our purposes. Again, if we bought such a building we would have to make certain structural changes and would also be put to the expense of furnishing the house all of which would mean considerable outlay, probably more money than we can afford to spend at present, so it seems as though it would be well for us to mark time.

WILLIAM H. ROBES, *Chairman*

APPENDIX NO 13

REPORT OF THE COMMITTEE ON CANCER

During the past months, the objectives of the Women's Field Army of the American Society for the Control of Cancer have been discussed from various angles. It was felt advisable that the Women's Field Army put on no drive in Massachusetts during 1938 owing to the conflict of their plans with the Massachusetts program. This was agreed to by Dr. Little as Executive Director of the American Society for the Control of Cancer.

It is obvious that the American Society for the Control of Cancer has little conception of the extensive program of lay education being carried on in this state under the joint auspices of the Massachusetts Medical Society and the Massachusetts Department of Public Health. There are at the present time co-operative cancer control clinics formed in two thirds of the towns and cities of the Commonwealth. Each consists of one representative from each organization, social or fraternal, in the town, and the total membership of these committees is over 5200. Each committee member arranges an address on cancer before his own organization at least once during the year. Emphasis has been laid on those talks being given by

physicians in the community. In this way, approximately 100,000 persons should be given information about cancer during the coming year, largely through their local general practitioners.

Since the *Commonwealth* number on 'Cancer' has been exhausted and requests for it are continually coming in (over 5000 copies have been distributed), it has seemed advisable to request the American Society for the Control of Cancer to allocate funds obtained in the Massachusetts drive of the Women's Field Army last year for the purpose of reprinting an enlarged and revised cancer booklet for distribution to those physicians interested in cancer control and education. We desire to make available to every physician in the Commonwealth such recent and authoritative information on cancer as he may require in discussion of the subject with his fellow practitioners and with the public.

It must be recognized that any campaign for education of the public with regard to cancer must rest on the initiative, knowledge, and missionary spirit of practitioners of medicine, because it is our conviction that any attempt at lay education by laymen will inevitably lead to misunderstanding and misinformation.

SHIELDS WARREN, *Chairman*

APPENDIX NO 14

REPORT OF THE COMMITTEE ON POSTGRADUATE INSTRUCTION

Last winter the general committee recommended that, after February 1, 1937, the Executive Committee cease active operations pending the result of negotiations with the state and federal agencies in regard to curricula and finances. Last June the committee recommended to the Council the following budget:

Massachusetts Medical Society	\$1000.00
State and federal agencies	4279.84
Total	\$5279.84

This recommendation was approved by the Council on June 2, 1937.

During last summer the Executive Committee negotiated with Dr. Chadwick, State Commissioner of Health, in early September, 1937, approval of the program and budget was secured from the United States Public Health Service, the Federal Children's Bureau and the State Department of Public Health.

During 1937 the committee had an appropriation of \$1000, of this amount \$766.67 was used, and the residue reverted to the treasury. The Executive Committee has requested an appropriation of \$1000 for 1938 to carry on the activities of the committee.

The Executive Committee organized a curriculum and began instruction on January 6, 1938. At the present time, courses are in progress in the following districts: Bristol North (Taunton), Bristol South (New Bedford), Essex South (Salem), Middlesex East (Melrose), Middlesex North (Lowell), Norfolk (Norwood), Norfolk South (Quincy), Plymouth (Brockton), Worcester (Milford) and Worcester North (Fitchburg).

In the spring the courses will be given in the following districts: Barnstable (Hyannis), Berkshire (Pittsfield), Bristol South (Fall River), Franklin (Greenfield), Hampden (Holyoke and Springfield), Hampshire (Northampton) and Middlesex South (Cambridge).

The committee wishes to report that there has been a most cordial spirit of co-operation between the gov-

ernment agencies and the committee. So far, comments from the districts have been generally favorable in regard to the courses. The chief change in the teaching has been the introduction of clinical demonstrations which have been well received. The courses have been offered free of charge to all legally registered doctors in the respective district societies.

It is recommended that the committee be continued and directed to co-operate with the government agencies in carrying out the present plan of postgraduate instruction.

FRANK R. OBER, *Chairman*
LEROY E. PARKINS, *Secretary*

APPENDIX NO 15

REPORT OF COMMITTEE ON PUBLIC RELATIONS

Landesman Resolution

Resolved, That a committee of five be appointed by the President of the Massachusetts Medical Society for the purpose of ascertaining what the actual duties are of the city and state health departments according to statutes, in order to prevent officers of these departments from encroaching upon, usurping legitimate practice, and undertaking unfair competition with the medical profession.

WILLIAM G. CURTIS, *Chairman*,
FRANCIS P. MCCARTHY,
HENRY M. LANDESMAN, *Secretary*

Discussion revealed that this matter had been considered in the report of this committee to the Council in June, 1935.

Lane Resolution

WHEREAS, The Massachusetts prepaid hospital plan has been endorsed in principle only by the Massachusetts Medical Society, June 9, 1936, and

WHEREAS, In numerous sections of the country similar plans have been on trial with varying degrees of success, and

WHEREAS, It is apparent that a definite line of demarcation must be drawn between the fundamental principles of medical practice and hospital services, and this distinction must be rigidly followed to insure success, and

WHEREAS, We, the Council of the Massachusetts Medical Society, being deeply concerned with preserving the best interests of patients, physicians and hospitals, as is the Associated Hospital Service Corporation, desire to maintain basic principles of medical practice and high standards of ethics to obtain the best results, therefore be it

RESOLVED, That we approve the prepaid hospital plan, with the stipulation that the contract benefit provided by group hospitalization insurance shall be limited to hospital accommodations such as room, bed, board, operating room facilities and general nursing care ordinarily provided by hospitals, routine drugs, and the routine service of interns only when acting under the direction of the attending physician, and that except as stated above, the contract shall not include the services of physicians either general or special. The term *physician* as used here shall be understood to include all licensed practitioners holding the degree of Doctor of Medicine, who assume on their own account to interpret laboratory and x-ray findings in terms of disease and diagnosis, or to administer or direct treatment.

Dr. Lane accepted the following amendment to his resolution

except as this resolution affects contracts now existing between hospitals and pathologists

The committee voted without dissent to postpone consideration and modification of the Lane Resolution until such time as the position of the pathologists on the matter can be determined. (Representative pathologists indicate that they have not yet crystallized sentiment in their specialty regarding their relation to prepayment hospital contracts but expect discussion at a forthcoming meeting.)

District Health Councils

The committee has again attempted to stimulate activity on the Hunt Plan for district health councils. This Council endorsed the plan and urged its initiation by district societies at the annual meeting in June, 1936.

The Board of Trustees of the American Medical Association at a meeting late in December, 1937, adopted the following resolutions which embody the spirit of the Hunt Plan.

WHEREAS, A varying number of people may at times be insufficiently supplied with needed medical service for the maintenance of health and the prevention of disease, and

WHEREAS, The means of supplying medical service differ in various communities, be it

RESOLVED, That the American Medical Association summarize the state and county medical societies to assume leadership, securing co-operation of state and local health agencies, hospital authorities, the dental, nursing and correlated professions, welfare agencies and community chests in determining for each county in the United States the prevailing need for medical and preventive medical service where such may be insufficient or unavailable and that such state and county medical societies develop for each county the preferable procedure for supplying these several needs, utilizing to the fullest extent medical and health agencies now available, in accordance with the established policies of the American Medical Association. Be it further

RESOLVED That the Board of Trustees of the American Medical Association establish a committee to co-operate with the Bureau of Medical Economics in outlining the necessary procedures for making further studies and reports of the prevailing need for medical and preventive medical services, and that the Secretary of the American Medical Association arrange to develop such activities through the secretaries of state and county medical societies in each instance, urging the formation of special committees in each county and state where committees are not available for this purpose.

Your committee voted to sponsor a joint meeting of all members of public relations committees of the several districts to promote the spirit of the plan and secure its adoption in whatever form is best suited to their respective communities.

ELMER S. BIGNALL, *Secretary*

APPENDIX NO 16

REPORT OF COMMITTEE TO STUDY THE BOUNDARIES OF THE DISTRICT SOCIETIES

At the 1937 February meeting of the Council a committee of five was authorized whose duty it would be to study the matter of boundaries of the district societies of the Massachusetts Medical Society.

This committee felt that as a result of the excessive use of transfer privileges certain district societies have accumulated a membership list which is unwieldy and serves neither the best interests of its members, the State Society, or the people. It would seem that any district society whose membership exceeds 300 is unwieldy and the parent body should consider favorably an application for partition on the part of a representative group within the district, capable of establishing and developing a new district society either by its own membership or in conjunction with a similar group split off from a neighboring district.

In order to ascertain whether the committee was justified in the foregoing opinions the chairman wrote to the secretary of each district society asking if any changes in district boundaries seemed advisable or desirable. Only eight secretaries of the eighteen districts replied to these inquiries. These eight secretaries stated that their districts were satisfied with their existing boundaries.

The first few lines of Article VII of the constitution of the Massachusetts Medical Society read as follows: The Councilors, upon the application of any five members of the said Society, may establish within such districts and portions of this Commonwealth as they shall think expedient, subordinate Societies.'

Inasmuch as there seems to be no interest on the part of the district societies in revising the existing district boundaries, and as the constitution of the Society already provides the means of forming new district societies, your committee makes no recommendation.

JOHN M. BIRNIE, *Chairman*

APPENDIX NO. 17

REPORTS OF COMMITTEES APPOINTED TO CONSIDER RESTORATION TO THE PRIVILEGES OF FELLOWSHIP

- 1 For Maxwell H. Bloomberg, Boston (Committee Andrew R. MacAusland, Archibald M. Fraser and Harold G. Lee)
- 2 For Chester P. Brown, Swampscott (Committee Loring Grimes, Hamlin P. Bennett and Mason R. Pratt)
- 3 For Alice E. Butler, Boston (Committee Eleanor B. Ferguson, Louisa Paine Tingley and Letitia D. Adams) This committee recommended that her past dues be remitted and that she pay dues for the current year.
- 4 For William A. Hunter, East Gardner (Committee Albert F. Lowell, Charles E. Thompson and Paul E. Dunn)
- 5 For Joseph Lentune, Boston (Committee Harlan F. Newton, Wyman Richardson and Laurence B. Ellis)
- 6 For Maurice Lugitch, Dorchester (Committee Hyman Morrison, John B. Hall and John P. Powers)
- 7 For Joseph E. Marien, Fitchburg (Committee George P. Norton, Thomas R. Donovan and Antonio D. Delisle)
- 8 For James H. Mason, Worcester (Committee George E. Emery, George A. Dix and George C. Lincoln)
- 9 For Arthur J. Tavera, New Bedford (Committee Thomas B. Horan, Wilford J. Rousseau and Carl C. Persons)
- 10 For Raymond C. Whitney, New Bedford (Committee Aubrey J. Pothier, Augustus H. Mandell and Harold E. Perry)

- 11 For Angelo M. Zarrella, Lynn (Committee Charles L. Hoyt, Charles A. Worthen and Frank E. Stone)
- 12 For T. N. Zervas, Lynn (Committee Nathaniel P. Breed, Stephen R. Davis and John W. Trask)

APPENDIX NO. 18

COMMITTEE APPOINTED TO CONSIDER PETITIONS FOR RESTORATION TO FELLOWSHIP

- 1 For J. B. Bakst, Lynn
Frank E. Stone, John W. Trask and Saul M. Marcus.
- 2 For Frederick W. Celce, Holyoke
Edward P. Bagg, Jr., Fred H. Allen and Philip H. Clarke.
- 3 For Abraham Green, Brookline
Charles J. Kichham, Albert Ehrenfried and John A. Seth.
- 4 For Aaron Kaufman, Boston
Joseph J. Skarball, Allen P. Joslin and Maurice B. Strauss.
- 5 For Raoul J. LeBeau, Spencer
James C. Austin, John R. Fowler and Alfred W. Brown.
- 6 For Joseph H. McLaughlin, Dorchester
Henry F. R. Watts, Carlton E. Allard and William J. Walton.
- 7 For Edward C. Messer, Dorchester
David G. Eldridge, Samuel Nadel and John B. Hall.
- 8 For Morris J. Ritchie, Westfield
Archibald J. Douglas, Edward S. Smith and Robert M. Marr.
- 9 For Lewis Siegel, Somerville
Louis J. Grandison, Edmund H. Robbins and Edward J. Dailey.
- 10 For Harry Silbert, Salem
James F. Donaldson, Charles L. Curtis and John R. Shaughnessy.

APPENDIX NO. 19

A PROPOSED CHANGE IN CHAPTER I, SECTION I OF THE BY LAWS

Dr. A. S. Begg,
Massachusetts Medical Society,
Boston, Mass.

Dear Dr. Begg:

It seems to me that when the Council passed Dr. Levi's resolution on June 2,

RESOLVED That the names and addresses of applicants for membership in the Massachusetts Medical Society and the name and address of the secretary of the district be published together in a special list in the *New England Journal of Medicine* at least two weeks prior to each censors meeting,

they really made a change in the by laws. I would suggest, therefore, that the following resolution be brought up

WHEREAS, On June 2, 1937, the Council passed a resolution presented by Dr. Alexander A. Levi to

the effect that the names and addresses of applicants for membership in the Massachusetts Medical Society and the name and address of the secretary of the district henceforward should be published together at least two weeks prior to each censors' meeting, and

WHEREAS, By passing this resolution the Council in effect made a change in the by laws directly modifying Section 1 of Chapter I dealing with requirements for fellowship, therefore be it

RESOLVED, That Chapter I, Section 1, of the by laws of the Society be amended to read as follows

Section 1 Applicants for admission to fellowship in the Massachusetts Medical Society are required to satisfy the censors that they are not less than twenty-one years of age, that they are of sound mind and of good moral character, that they possess a good English education, that their names and addresses and the name and address of the secretary of the district society in which they reside have been published in a special list in the *New England Journal of Medicine* at least two weeks prior to their examination by the censors, that they have received a diploma from a medical school or college recognized by the Council, or that they have, in each instance, received the approval of the Committee on Medical Education and Medical Diplomas, that they do not practice medicine in a manner contrary to the Code of Ethics of this Society, and they shall appear personally before the censors and satisfy them that the above requirements are fulfilled.

Yours sincerely,

REGINALD FITZ, M.D.

APPENDIX NO 20

PROPOSED CHANGES IN THE BY LAWS

The following paragraphs in the designated chapters under the proposed changes will read as follows

CHANGE NO 1 (Appendix 19)

CHANGE NO 2

CHAPTER VI (DUTIES OF TREASURER)

Section 4

Paragraph 4 He shall attend the meetings of the Committee on Financial Planning and Budget, furnish the committee with such data as it may require and shall make all investments and reinvestments of the Society's funds with authority to buy or sell securities subject to the approval of this committee.

CHANGE NO 3

CHAPTER VII

Section 3

The Committee on Membership shall consist of five fellows. It shall hold a stated meeting the week next preceding each council meeting and such other meetings as may be necessary.

The committee shall consider all matters relating to honorary or associate fellowship, retirement, resignation, deprivation of the privileges of fellowship or remission of dues, and shall make recommendations to the Council concerning the same. It shall consider all petitions of fellows to be transferred from one district society to another in accordance with the provisions of Chapter III, Section 3.

All bills incurred shall be countersigned by the chairman and forwarded to the president for his approval.

CHANGE NO 4

CHAPTER VII

Section 10

The Committee on Financial Planning and Budget shall consist of five fellows. It shall hold a stated meeting during the week before the February meeting of the Council and such other meetings as may be necessary.

It shall consider in a broad way how the Society can best use its income. Based upon such consideration it shall recommend to the Council at its February meeting the budget for the current fiscal year, after consideration of the estimates for expenses for the current fiscal year that have been submitted by individual members, the committees and officers of the Society. It shall consider all requests for extraordinary appropriations and shall recommend to the Council whether or not they shall be granted.

Following the close of each fiscal year, this committee after consultation with the treasurer with the approval of the Council shall determine the amount to be refunded to the several district societies from the balance remaining in the treasury on December thirty first. This amount shall be apportioned among the district societies according to the number of annual assessments which shall have been paid to the district treasurers previous to March first.

All bills incurred shall be countersigned by the chairman and forwarded to the president for his approval.

CHANGE NO 5

CHAPTER VII

Section 11

Reports of standing or other committees containing recommendations which may require mature consideration before their adoption shall be sent in abstract to the secretary of the Society, at least four weeks before their presentation to a meeting of the Council, for publication in the official organ of the Society.

PROGRESS IN TUBERCULOSIS, 1936-1937

JOHN B. HAWES, 2ND, M.D.,* AND MOSES J. STONE, M.D.†

BOSTON

THE advances made in the past decade in the field of pulmonary tuberculosis have been so rapid and so striking that by comparison the past year appears comparatively barren as to new advances or real progress.

Both diagnosis and treatment are now on a concrete basis. Most of the controversial points are rapidly disappearing. The x-ray occupies a pre-eminent place in early diagnosis. Collapse therapy is definitely recognized as the best mode of treatment in the active and advancing types of this disease. Laboratory studies are on a firm footing as adjuvants in diagnosis as well as in treatment. One is no longer satisfied with direct smear examinations of the sputum. In negative cases, the concentration method is being adopted in all the best sanatoriums. In the majority of institutions, the culture method as well as that of guinea pig inoculation is required before one can designate a case of tuberculosis as closed or negative.

The outstanding advances of the past year have been made through epidemiologic studies. Education along every line has accomplished much. The public is becoming more aware of the tuberculosis problem, and is willing to spend money as well as to submit to examinations in order to guard against this disease. The detection of tuberculosis is now an integral part of state and city health departments as well as of community organizations. We are no longer satisfied to wait for patients to come to the doctor's office, but are searching for the disease in the apparently healthy members of the community. While this activity lacks the dramatic element of laboratory and clinical research, it constitutes progress in the right direction.

EPIDEMIOLOGY

Schuman (*Am Rev Tuberc* 34 85-95, 1936) has made a study of contact as a factor in the transmission of tuberculosis. He emphasizes positive sputum as the greatest single factor in the spread of pulmonary tuberculosis. He finds a definite relation between the incidence of tuberculous infection in children and a positive sputum contact. In his investigation, individuals exposed to positive sputum cases showed an increased degree of sensitivity, as is indicated by the intensity of reaction to tuberculin. He points out what was well known before: that control of positive sputum cases is the most effective means of limiting the spread of the disease.

*President Boston Tuberculosis Association.

†Assistant professor in medicine Boston University School of Medicine. Assistant physician Beth Israel Hospital.

Shurly and Brachman (*Am Rev Tuberc* 34 96-106, 1936) remind us of the latent sources of contact, and plead for a more widespread search for tuberculous individuals, particularly where people gather regularly for work, education, recreation or partaking of food.

In a study of tuberculosis in college students, Shepard (*Am J Pub Health* 25 1118-1124, 1935) says that the American Student Health Association calls for surveys, including histories, physical examinations, tuberculin-testing, x-ray studies of positive reactors and the follow-up of cases discovered or suspected. Recent surveys have shown about ten times as many known cases of tuberculosis in colleges with control programs as in colleges with no methods of early detection.

Harrington, Myers and Levine (*J A M A* 104 1869-1874, 1935) write that school surveys should and must include the entire personnel. In a campaign conducted in the Minneapolis schools, definite evidence of parenchymatous involvement was found in 78 teachers or other employees. Of these, 69 apparently had pulmonary tuberculosis and 9 had nontuberculous lesions. One employee was found to be disseminating tubercle bacilli, and 68 others presented lesions that were probably due to tuberculosis of the parenchymatous type. Subsequent examinations have brought to light 5 more open cases of tuberculosis. These writers recommend periodic examinations of those with non-progressive lesions.

The problem of home contacts receives the attention of Kayne (*Brit M J* 1 692-696, 1935). He concludes that postnatal contact is by no means always fatal and does not always infect, but does so in a large proportion of children. He urges early separation of children from the source of contact, though they may already be infected. He feels that such separation is certainly indicated up to the age of five.

Stewart (*Am J Dis Child* 50 853-871, 1935) deals with the relation between the childhood or primary type and the adult or reinfection type of tuberculous disease. His conclusion is that primary infection, aside from the danger of miliary dissemination or meningitis, leads to a change in tissue sensitivity which is distinctly harmful as regards later reinfection. This being the case, he says, a first infection with tubercle bacilli is not necessarily a beneficial protective experience. By his view, tuberculosis can best be prevented by

the effect that the names and addresses of applicants for membership in the Massachusetts Medical Society and the name and address of the secretary of the district henceforward should be published together at least two weeks prior to each censors meeting, and

WHEREAS, By passing this resolution the Council in effect made a change in the by laws directly modifying Section 1 of Chapter I dealing with requirements for fellowship, therefore be it

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Yours sincerely,

REGINALD FITZ, M.D

APPENDIX NO 20

PROPOSED CHANGES IN THE BY LAWS

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CHANGE NO 1 (Appendix 19)

CHANGE NO 2

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All bills incurred shall be countersigned by the chairman and forwarded to the president for his approval.

CHANGE NO 4

CHAPTER VII

Section 10

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CHANGE NO 5

CHAPTER VII

Section 11

Reports of standing or other committees containing recommendations which may require mature consideration before their adoption shall be sent in abstract to the secretary of the Society, at least four weeks before their presentation to a meeting of the Council, for publication in the official organ of the Society

ings, the total number of neutrophilic polymorphonuclear leukocytes per cubic millimeter had the highest correlation with poor recovery

Interesting observations on blood studies as an aid in selecting cases of pulmonary tuberculosis for thoracoplasty are made by Muller (*Am Rev Tuberc* 35 83-98, 1937) Patients with marked activity as revealed by the leukocytic index and the sedimentation rate respond well to thoracoplasty if the trend of the blood as revealed by serial examinations indicates progressive improvement before the operation If, on the other hand, patients show an increase in the sedimentation rate and the leukocyte index, and a shift to the left on serial examinations, they do not derive the expected benefit from the operation and may even be harmed by it

Pinner and Woolley (*J Thoracic Surg* 5 476-480, 1936) call attention to the necessity of qualifying the term "negative sputum" by stating explicitly the methods used in the search for tubercle bacilli They hold that the unqualified term has as little meaning as have "normal renal" or "normal cardiac function" unless it is known by what observation or tests normality was assumed to exist One should specify as to negative sputum on direct smear, concentration culture or guinea-pig inoculation

B C G

The work done in western Europe with B C G immunization is reviewed by Kayne (*Am Rev Tuberc* 34 10-42, 1936) He concludes that this method is harmless, and is of some value if used under certain conditions as an adjunct to other means of prophylaxis He deplores the over-enthusiasm and the exaggerated claims of Calmette and his followers

Aronson and Dannenberg (*Am J Dis Child* 50 1117-1130, 1935) report on their studies at the Phipps Institute in Philadelphia over a period of seven years on 70 children vaccinated orally with B C G within the first ten days of life, and 167 non vaccinated children observed as controls Their observations indicate that the administration of B C G vaccine to newborn children exposed to patients with manifest tuberculosis may prove of value in reducing the mortality from this disease in infancy and childhood

Epstein, B (*Jahrb f Kinderh* 145 237-264, 1935) is skeptical as to the protective effects of B C G He still believes that separation from tuberculous persons is the best method of prophylaxis He adds, however, that administration of B C G should be continued, but only to children who are forced to live in tuberculous surroundings

Kereszturi and Park (*Am Rev Tuberc* 34 437-455, 1936) again report on their extensive

study of B C G vaccine as a prophylactic agent against tuberculosis in children Their evidence shows that the vaccine is harmless to animals and to human beings They conclude that since it increases considerably the resistance to tuberculosis, it should be advocated as a public-health measure for the prevention of tuberculosis in those who have not yet become infected, and who may later be exposed to it in their homes

TREATMENT

An illuminating discussion of the role of bronchoscopy in tuberculous tracheobronchitis is supplied by Samson (*Am Rev Tuberc* 34 671-699, 1936) He thinks that the widening recognition of this disease as a clinical entity demands that a bronchoscopic examination be frequently used for a final diagnosis In selected cases, bronchoscopic aspiration and chemical shrinkage of congested and edematous mucosa will give relief from distressing respiratory symptoms Occasionally such treatment is a life-saving measure In addition, bronchoscopic observation determines to a large extent what type of collapse therapy, if any, should be employed, since no form of collapse therapy should be used when ulcerative lesions are discovered in the bronchi

Buckles (*Am Rev Tuberc* 35 581-589, 1937) pleads for more frequent bronchoscopic examination in the routine treatment of chest disease Groups interested in diseases of the chest should organize better bronchoscopic services, as differential diagnosis is often dependent on bronchoscopy Much knowledge is to be gained from constant observation of the bronchi, and tuberculous patients may require the same bronchoscopic aid as do those with polyps, stenosis, carcinomas, ulcerations, bleeding points and bronchial obstructions due to other causes

SANOCRYSIN

Terril (*Am Rev Tuberc* 34 156-159, 1936) is one of the very few American specialists in tuberculosis to give the results of sanocrysin treatment He reports on only a small group, and recommends this measure as one supplementary to rest and collapse therapy

COLLAPSE THERAPY

Crimm and Strayer (*J Thoracic Surg* 5 441-443, 1936) urge that all patients with satisfactory collapse of the lung who have a positive sputum be bronchoscoped for possible stenosed bronchi or tuberculous tracheobronchitis

A statistical study compiled by Todd (*J State Med* 44 410-413, 1936) shows that when successful pneumothorax has been accomplished the expectation of life is increased by ten years Early diag

preserving the normal uncontaminated state of the tissues, a condition which operates to prevent more than 99 per cent of all initial infections acquired in the first fifteen years of life from producing fatal forms of tuberculosis during this period

The racial element is discussed by Pinner (*Am Rev Tuberc* 35 41-42, 1937) He asserts that no one single factor can explain or control the epidemiologic and pathogenic behavior of tuberculosis While it seems likely that race is important, living conditions in the broadest sense of the word are of greater significance, and many other factors, known and unknown, determine the course of events

Opie, McPhedran and Putnam (*Am J Hyg* 22 644-682, 1935) studied the exogenous infection of children and adults They found that among white persons exposed to open tuberculosis between birth and nine years of age, ten per cent of those living from twelve to fourteen years after exposure began have acquired the disease Among persons first exposed between the ages of ten and fourteen, 20 per cent living from 10 to 14 years after exposure have acquired it Of those exposed after fifteen, 10 per cent living from ten to fourteen years afterward have become infected The authors maintain that after the age of fifteen, infection is with a few exceptions of the adult type They think that the disease is then acquired by contact, and is not a continuation of the childhood type

Whitney and McCaffrey (*Am Rev Tuberc* 35 597-608, 1937) summarize the results of group tuberculin testing with purified protein derivative in the United States, applied to 56,688 individuals in thirty states and the District of Columbia The percentage of positive reactors in this study was 47 There were fewer positive reactors proportionately among six-year-old children than among those at any other age Following the sixth year of life, the trend of infection was generally upward at an average rate of over 1 per cent for every year up to the age of twenty Of particular interest is the fact that the percentage of positive reactors among the 8276 persons reported to have had contact with tuberculosis was 54.2, whereas only 33.3 per cent of those with no history of contact responded with positive reactions The infection rate for the contacts under five years of age was three times that for non-contacts in the same age group Nativity and parentage seemed to be significant factors in tuberculous infection among the white persons tested Native-born Americans of native parentage had 27.6 per cent positive reactors, whereas among the native-born of foreign stock 38.4 per cent reacted positively, and 61.2 per cent of the foreign-born did so

DIAGNOSIS

Lord (*New Eng J Med* 213 1181-1183, 1935), writing on the differential diagnosis of pulmonary tuberculosis, emphasizes the following clinical points

- 1 A family history of contact with tuberculosis or other opportunity for contagion may have an important bearing
- 2 A past or present history of hemoptysis out of a clear sky is especially suggestive of pulmonary tuberculosis
- 3 Primary pleurisy with effusion is equally significant

Tuberculin tests he considers most valuable in youth in screening out negative reactors, and he reckons the leukocyte count as of value because of the usual absence of leukocytosis in uncomplicated tuberculosis He stresses especially that physical signs may be negative with early active or indolent deep-seated lesions

White (*New Eng J Med* 213 1179-1181, 1935) considers the differential diagnosis of pulmonary tuberculosis and pulmonary circulatory changes. The following factors, he says, may be taken to indicate that the condition is of cardiac origin

- 1 A history of severe and prolonged substernal pain, usually necessitating morphine, with or without typical angina.
- 2 Enlargement of the heart, always present after coronary thrombosis and before failure.
- 3 Abnormal indications in an electrocardiogram, pointing to recent coronary thrombosis
- 4 X-ray evidence of enlargement of vessels at the hilum, often extending radially outward.
- 5 Preponderance of rales at the lung bases, or sometimes asthmatic wheezing with squeaks and groans.

He adds that pulmonary thrombosis or embolism with infarction may cause confusion with tuberculosis because of sudden chest pain and either hemoptysis or pleural exudate Careful study, however, will enable one to distinguish these conditions.

The interpretation of x-ray films of the chest receives consideration by Dunham (*Tubercle Am Sect* 17 33-38, 1935), who asserts that no one can make a diagnosis solely through them He finds that the misconceptions expressed by the terms "anular shadows" and "peribronchial" or "peritruncal" tuberculosis have almost disappeared Anular shadows are either real cavities or localized areas of emphysema, while truncal shadows usually have no relation to tuberculosis

LABORATORY STUDIES

Boissevain and Spillane, Jr (*Am Rev Tuberc* 35 661-662, 1937) have mathematically correlated blood counts and clinical symptoms with recovery from tuberculosis Among clinical symptoms amount of cough had the highest correlation coefficient with recovery Among the laboratory find

pneumothorax. When pneumothorax is impossible on either side, or adhesions cannot be cut successfully, bilateral thoracoplasty should be done.

According to O'Brien (*J Thoracic Surg* 5 123-131, 1935) there is no phase of the disease in which collapse therapy is not indicated, except the terminal one. In early lesions, the operation of choice is phrenic crushing. O'Brien warns, however, against leaving the patient in bed for an indefinite period after this operation. If improvement of the lesion is not apparent in a few weeks, pneumothorax should be added. In patients with unilateral, rapidly spreading soft lesions, in acutely ill patients, with multiple or large cavitation or extensive disease, and in tuberculous pneumonia cases with productive lesions with large thick-walled cavities, pneumothorax should be instituted at once. Thoracoplasty is necessary when cavities are not closed by the above procedures. While extrapleural packs may be used in a few exceptional cases, he advises against it.

Pollock and Forsee (*J Thoracic Surg* 55 509-524, 1935) recommend phrenicectomy as an adjunct to pneumothorax therapy. It is useful when adhesions cause cavities to remain open, when obliterative pleuritis occurs during re-expansion after completion of a successful pneumothorax, and in unsatisfactory pneumothorax due to a partially adherent pleura. They advise phrenicectomy also in order to close basal, central or hilar cavities when there are no apparent adhesions.

Urquhart (*Am Rev Tuberc* 35 443-463, 1937) reports on 542 thoracoplasty operations performed on 200 patients. His results are quite satisfactory, and he is distinctly optimistic as to the results following this operation. Of the 200 patients operated upon, the disease was apparently arrested in 59.5 per cent and 24 per cent were improved. Only 4 per cent failed to improve, and 12.5 per cent died. Most of the cases not yet in the apparently arrested group will as time goes on take their place there.

PNEUMONOCOINOSIS

Egbert and Geiger (*Am Rev Tuberc* 34 143-150, 1936) record a case of pulmonary asbestosis and carcinoma. A search of the literature failed to show a report of the coexistence of these conditions, although cancer does occur in cases of silicosis. The authors merely speculate as to the interrelation of the two processes.

Sokoloff (*Am Rev Tuberc* 34 700-711, 1936) studied 418 coal miners institutionalized because of chronic disabling pulmonary disease. He says that tuberculosis occurs more frequently in coal miners than was formerly believed. He suspects that this increase in tuberculosis is concomitant with changed working conditions in coal mines which

expose the workers not only to carbon particles, but also to a tremendous amount of fine silica particles. This combination produces anthracosilicosis rather than the pure anthracosis seen in the lungs of coal miners of twenty-five or thirty years ago. Thus tuberculosis was encountered in more than half the cases studied.

A definition of silicosis is attempted by Heffernan (*Tubercle* 16 397-405, 1935). He makes the following points:

1. Silicosis is a nodular fibrosis of the lungs produced by the inhalation of siliceous dust.

2. The interaction which produces silicosis is electrochemical and is caused by free silica. Mineral silicates, such as asbestos, when freshly pulverized into fine powder are also electrochemically active at the surfaces of the particles, and capable of acting in a similar manner to powdered quartz, but to a much more limited extent, setting silica partially free at the surfaces. Aqueous solutions of some silicates are systems containing, when freshly made, active silica hydrosol. Silicosis must be interpreted in chemical rather than in mechanical terms.

In another paper (*Tubercle* 17 250-255, 1936), Heffernan emphasizes the distinction between silicosis—the typical reaction of a healthy lung to inhalation of very fine silica dust—and dust retention—a comparatively passive process going on in diseased or damaged lungs subjected to the influence of any dust fine enough to be inhaled. Silicosis is an active dynamic process with a unique and specific histopathology. Healthy lungs can apparently deal with all forms of dust except free silica or certain combinations of silica like asbestos, which also may be capable of inducing chemical reaction.

Middleton (*Tubercle* 17 241-249, 1936) lists the occupations which constitute silicosis hazards. Among them are the pottery industry, sandstone and granite work, metal-grinding, sand-blasting, the manufacture of scouring powders, and coal-mining. In Great Britain the medical examination of workers exposed to certain kinds of dust, namely silica and asbestos, is obligatory. The physical requirements to be met are as follows: the chest must be of at least average development and the respiratory passages must be free from obstruction, there must be no signs of heart or lung disease, and there must be no evidence of tuberculosis.

MISCELLANEOUS

Moorman (*Am Rev Tuberc* 35 347-353, 1937) discusses the home versus the preventorium in the management of tuberculosis contacts. After viewing the question from many angles, he concludes that even though the results warrant an all-inclusive preventorium program, its cost makes it prohibitive. He urges a comprehensive dispensary scheme, which in addition to case-finding, family supervision and community education requires the

nosis is of course the all-important factor in prognosis. As to the ultimate prognosis, Todd is of the opinion that in the final analysis it depends largely upon the selection of cases and attention to detail during active treatment.

Gross and English (*Am Rev Tuberc* 35 303-322, 1937) advocate compression therapy for children with the adult type of active pulmonary tuberculosis. They found that juvenile patients did not do well when harboring this type. Mere routine rest in bed, plus a high-vitamin diet, has proved unsatisfactory in stemming the appalling death rate from this condition. They urge immediate compression therapy as soon as the adult disease appears, artificial pneumothorax being the procedure of choice. They add that one should not hesitate to do bilateral artificial pneumothorax if indicated. These patients are generally in need of such procedure, because the outlook without compression is extremely doubtful.

Early artificial pneumothorax therapy in minimal cases of tuberculosis is urged by Turner and Collins (*Am Rev Tuberc* 34 792-807, 1936). Reviewing their experience with 40 cases of minimal tuberculosis, they find that the operative risk is negligible, and that complications are so infrequent as not to constitute a deterrent for the use of pneumothorax in early cases. The conversion of sputum has been shown to be prompt and certain, and the percentage of cases with free space is high.

Certain danger signals in artificial pneumothorax therapy are listed by MacKay (*Am Rev Tuberc* 34 808-814, 1936). If free oscillations of the manometer on the negative side are obtained, accidents will be rare. Slight manometric fluctuations may be noted with the needle in the neighborhood of the parietal pleura, in the lung or air passages, or even in the pulmonary veins, and thus the utmost care must be taken in order to avoid accidents under such circumstances.

Stafford (*Am Rev Tuberc* 34 402-420, 1936) attempts to answer the very elusive question of when to terminate artificial pneumothorax treatment. He recognizes that in numerous cases the lung will frequently re-expand in spite of all the re-fills, the time of termination thus being arbitrarily settled. As to voluntary re-expansion of the lung, there are many pitfalls and problems. Among the factors requiring consideration are the extent and character of the pathologic process in the lung before compression, the clinical course of the disease before collapse, the constitutional condition of the patient at the time, the period since sputum was last free from tubercle bacilli, the economic status of the patient, and a general review of the indications for collapse therapy in the given case. A red-cell sedimentation rate may also be helpful in

determining whether there is activity in the collapsed lung. He wisely points out that, in general, with fairly light infiltrations occurring throughout a lobe and without cavitation the lung should remain collapsed for two or three years, although this practice cannot and should not be strictly adhered to. With heavy consolidations with or without thin-walled cavities the lungs should stay collapsed for at least four years, and dense fibrocaseous lesions with thick-walled cavities require five, six or more years to heal under compression.

Dufault (*Am J Roentgenol* 30 781-786, 1935) discusses the re-expanded lung. He agrees with many other writers that the type of lesion has more influence than has the extent. Exudative lesions may heal completely, leaving no scar. A period of three years does not seem to him too long a time to keep a collapse instituted for an exudative lesion in a young individual, nor is one of six or seven years too long for an ulcerocaseous process.

Dundee (*Brit J Tuberc* 30 55-61, 1936), treating the problem of when to terminate pneumothorax therapy, states that the longer the treatment, the fewer the relapses after re-expansion. He mentions the following factors as meriting consideration: (1) extent and nature of the original lesion (when there has originally been a large area of cavitation, pneumothorax should be continued indefinitely) and (2) behavior of the lesion as shown by x-ray during re-expansion. A complete x-ray serial of each case should be in the hands of the operator, as a tuberculous lesion often undergoes frequent radical changes during pneumothorax treatment. The most important change is reappearance of excavation, which calls for the immediate resumption of re-fills in order to close the cavity. The younger the patient, the greater the reason for prolonging treatment. In those who must return to hard manual labor, treatment should be continued considerably longer than with other patients, and often indefinitely. Pregnancy may be considered fairly safe during the fourth or fifth year of pneumothorax therapy, provided this is carried out for at least a year after pregnancy has terminated.

Coryllos and Ornstein (*J Thoracic Surg* 5 337-376, 1936) give a fairly detailed account of the management of bilateral cavernous pulmonary tuberculosis. No bilateral case, they hold, should be considered hopeless so long as one fourth of the lung parenchyma is free from disease. When bilateral apical cavities are present, bilateral pneumothorax should be attempted beginning on the more affected side. The authors oppose phrenicectomies and phrenicotomies. If pneumothorax is not possible on one side, thoracoplasty should be done after the opposite lung is satisfactorily collapsed selectively by

CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITALANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24111

PRESENTATION OF CASE

A sixty-one-year-old American housewife entered the hospital complaining of dyspnea, cough and weakness.

For the month before entry she had noticed generalized weakness accompanied by a low-grade fever, loss of weight, dyspnea and a hacking unproductive cough.

Fifteen years before entry her gall bladder had been removed for chronic cholecystitis with cholelithiasis. She had been essentially well for the next twelve years, when on one occasion she expectorated about a teaspoonful of bright red blood. About two months later she had an attack of apparent bronchitis with a temperature of 103°F. At this time it was noted that her heart was fibrillating, but shortly thereafter the rhythm became normal. During the next two years she had occasional brief attacks of angina-like pain which were relieved by nitroglycerin. Her physician had noted a definite enlargement of the heart and loud systolic murmurs at the apex and base. She also had slight palpitation toward the end of this period, and she was therefore given digitalis, which she continued to take up to entry. A year and a half before entry, without preceding trauma, she developed an ecchymotic area over the right malleolus. The lesion slowly disappeared.

Her family history was noncontributory.

Physical examination revealed a well-developed, fairly well-nourished woman who showed evidence of weight loss. Above the left clavicle there were two walnut-sized, very firm nodules, one situated almost in the midline and the other lateral to it. The heart was enlarged, its rhythm was regular, and there was a loud systolic murmur at the apex. The blood pressure was 110 systolic, 70 diastolic. The lungs showed signs construed as representing less air going into the left than into the right. The liver edge could be just felt below the costal margin. There was no abdominal spasm or tenderness, and no masses could be palpated. There was slight tenderness in the right costovertebral angle. The temperature was 99.5°F, the pulse 88. The respirations were 24.

The urine had a specific gravity of 1.010 and contained the slightest possible trace of albumin. The

blood showed a red-cell count of 4,870,000 with 85 per cent hemoglobin, and a white-cell count of 10,100, with 72 per cent polymorphonuclears, 20 per cent lymphocytes and 8 per cent monocytes. The red cells and platelets were normal. Stool examinations were repeatedly negative. The non-protein nitrogen of the blood was 27 mg per cent. Culture of a catheter specimen of urine yielded bacillus coli. The blood Hinton test was negative. The sedimentation rate was 30, 46, 49, 50 mm with 58 per cent plasma.

X-rays of the chest showed no evidence of intrathoracic goiter or other mediastinal tumors. The trachea was in normal position. The lung fields were clear. The blood vessel markings of the lungs were rather prominent, and the heart shadow was considerably enlarged both downward and to the left in the region of the left ventricle. There was slight elevation of the left diaphragm with absence of respiratory motion during quiet breathing and limited motion during forced breathing. In a film taken at forced expiration the left lung was distinctly more radiant than the right. There was irregular density of the left lung root, along the course of the bronchus to the upper lobe. An intravenous pyelogram showed a rather low right kidney with very slight dilatation of the pelvis and some kinking of the ureter at the ureteropelvic junction. No other abnormalities were seen. There were slight proliferative changes about the bodies of the vertebrae. A gastrointestinal x-ray series was essentially negative. The liver shadow seemed somewhat enlarged.

An electrocardiogram showed a normal rhythm and sagging of all the S-T intervals. All the T waves were diphasic, possibly due to digitalis. Lead 4 was normal.

The patient remained in the hospital for a period of eight months and during the entire time her temperature showed a daily fluctuation between 99° and 100°F., occasionally rising as high as 101° or 102°F. and often falling as low as 98°F. Her pulse rate remained practically constant at 80. Examination of about 85 urine specimens showed a specific gravity varying between 1.010 and 1.030. None of them contained more than the slightest possible trace of albumin, and the sediments showed a few white cells, often a few red cells, but never casts. Several cystoscopic examinations were done, always with entirely negative findings, sterile cultures from both ureters and negative results from guinea-pig inoculation of the urine. The non-protein nitrogen never rose above 32 gm per cent. One serum protein determination was 6.4. The red count slowly sank to 3,750,000, the hemoglobin to 65 per cent. White counts ranged from 10,000 to 13,500 and the percentage of polymorphonu

breaking of contact by removing the patient, rather than the exposed child or children from the home. This does not apply to summer camps and prevention schools.

The principles and factors involved in manometric readings of intrapleural pressures in artificial pneumothorax are outlined by Peters, Pope and Hudson (*Am Rev Tuberc* 34 614-626, 1936). They make the following suggestion for general adoption in the construction of artificial pneumothorax apparatus for the purpose of bringing about greater uniformity and accuracy in practice and in recording intrapleural pressures. For the manometer and the tubing, they recommend a diameter of from 3 to 5 mm (average, 4 mm), for the pneumothorax needle they advise a 17 to 20 gauge (average, 18 or 19 gauge) needle from 5 to 6 cm long. The tubing should be as short as feasible, but of sufficient length to extend from the outlet of the pneumothorax apparatus to the needle when the latter is inserted in the chest.

Salkin, Cadden and McIndoe (*Am Rev Tuberc* 34 634-648, 1936) present an interesting study refuting the hypothesis of Coryllos regarding the closure of pulmonary cavities. They show that blocking a draining bronchus does not cause the healing of a cavity. They deny that the failure of an intra-bronchial lipiodol injection to enter a cavity means that there is no physical evidence of a cavity.

A case of pregnancy and successful parturition during the course of bilateral artificial pneumothorax is reported by Peters and Davenport (*Am Rev Tuberc* 35 71-82, 1937). They believe that pneumothorax therapy should never be discontinued because of an intercurrent pregnancy. It should always be considered among other therapeutic measures in pregnant women with pulmonary tuberculosis. In fact, they feel that in the presence of active progressive lesions it is more often indicated than is therapeutic abortion.

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explain the increased brilliancy of the left lung. The glands in the neck are not calcified. The films of the skull are negative. The kidney outlines are quite distinct. She has a low right kidney with some increase in size of the pelvis on that side which usually happens when the kidney is low. There is nothing unusual in its shape. I do not see anything suggesting stones or disease of the kidney other than slight dilatation of the pelvis of the right kidney.

DR TRACY B. MALLORY: It has occurred to me why that second set of x-rays of the hands was taken. The question of sarcoid had been raised at one period.

DIFFERENTIAL DIAGNOSIS

DR. BAUER: The x-ray changes in the terminal phalangeal joints are those of degenerative arthritis. These we see in most women sixty-one years of age. There is no suggestion of a destructive lesion such as we see in sarcoid.

It would appear that we are dealing with a woman who had an unexplained fever which continued throughout her hospital stay. The only obvious finding on physical examination at the time of entry was a definitely enlarged heart without obvious cause, that is, she had no evidence of valvular heart disease or of hypertension. She did give a history of angina-like pain relieved by nitroglycerin. I presume the most reasonable explanation of the cardiac enlargement would be hypertrophy secondary to sclerosis of the coronary arteries.

As I went over this case history I thought that some disease commonly associated with erythema nodosum was the most likely cause of this patient's illness and death. The description of the recurring skin lesions seemed more in keeping with a diagnosis of erythema nodosum than with a diagnosis of erythema induratum. I have always considered the lesions of erythema induratum as being painless. These lesions recurred and did leave some scarring. Thinking that we were dealing with an individual who had had recurrent attacks of erythema nodosum, I thought it wisest to consider seriously the two diseases most commonly associated with erythema nodosum, namely rheumatic fever and tuberculosis. I rather wished as I went over the history, that the pathologist had not told us what he had found in the gland and skin, feeling that since he had given us this information probably the diagnosis of tuberculosis was not adequate.

I cannot understand why her urinary tract was so thoroughly investigated on repeated occasions. The urine did contain a slight trace of albumin and a few white and red blood cells but never any

casts. From reading the case report I thought a low kidney was adequate explanation for the slight dilatation of the pelvis and the kinking of the ureter observed. I cannot believe that she had any serious infection of the genitourinary tract. A mild cystitis would best fit the findings. I should not have expected washing of the kidney pelvis to bring about such a dramatic improvement of the skin lesions. The relief experienced was coincidental rather than cause and effect.

Is there anything in this case history to enable us to make a diagnosis of rheumatic fever? I should say no. This woman did run a low-grade fever, the pulse, however, was always 80. There is nothing in the story which suggests rheumatic fever to me. She did have this one attack of arthritis which I think was more likely part and parcel of the erythema nodosum than a manifestation of rheumatic fever. Can we explain this clinical picture on the basis of tuberculosis? She did give a history of expectorating about a teaspoonful of bright red blood three years prior to this last hospital entry. Two months later she suffered from what was diagnosed bronchitis. At this time a small tuberculous peribronchial lymph node may have broken down and eroded into a bronchus with the resulting slight expectoration of blood. If this occurred she may have had a slight tuberculous pneumonia resulting secondarily. We know that the physician in charge suspected that the nodes present in the supraclavicular region might be radiosensitive. That they did not represent any form of lymphoma was clearly demonstrated because x-ray treatment resulted in their breaking down. This fact plus the persistent sinus leads one to suspect that the nodes were tuberculous. Subsequent removal of one node proved that it was tuberculous. Is it possible that we are dealing with an individual who had tuberculosis involving the supraclavicular and tracheobronchial lymph nodes? Could caseation and erosion of one of these nodes explain the pulmonary symptoms that she had three years before entry? If she did have an erosion of one of the bronchi and a breaking down of a lymph node it might possibly be that tubercle bacilli were entering the blood stream from time to time. That of course is a guess. One does have to bear in mind the possibility of Hodgkin's disease. We know that Hodgkin's disease is intimately associated with tuberculosis at times. Some workers have succeeded in isolating tubercle bacilli from Hodgkin's lymph nodes and therefore concluded that tuberculosis was the etiologic agent. We further know that Hodgkin's disease often follows tuberculosis. I think I am right in saying that in some glands you can demonstrate both, is that right?

clears from 79 to 92 per cent. No abnormal cells were ever found in the smear. Several blood cultures showed no growth and agglutination tests for typhoid and bacillus abortus were negative.

Shortly after entry she was given 1200r units of x-ray radiation over the gland in her neck and 600r over her chest. A subsequent x-ray examination of the chest showed better aeration of the left lung.

About two weeks after entry she began to complain of an irritating sensation in the palm of the left hand and in the left elbow. A week later the right wrist, the left ring finger and the left elbow became swollen and red. X-rays showed no abnormalities of the bones or soft tissues in these areas but several terminal phalangeal joints showed narrowing of the joint spaces and proliferative changes about the joint margins. Within a few days all the joints in her body began to ache and simultaneously many reddish, slightly indurated, tender spots about the size of a dime appeared on her legs, arms and body. At this time one of the cystoscopies was performed and the pelves of the kidneys were injected with 2 per cent mercuriochrome. A remarkable improvement in her symptoms followed, the temperature dropped, the joint pains disappeared and the skin lesions regressed, leaving only indefinite slightly depressed scars. In the course of ten days, however, the symptoms recurred and new skin lesions developed. A second cystoscopy with dilatation of the ureters was followed by another remission in symptoms, this time of longer duration.

Meanwhile the gland in the neck which had been treated by x-ray began to show signs of breaking down. About three months after entry it began to ooze purulent material and two weeks later it was curetted but the material was too necrotic to permit a histologic diagnosis. The swelling was relieved by this treatment but a persistent sinus developed. Her general condition improved, though fever continued and new crops of skin nodules appeared. These were, however, smaller and less tender than the earlier ones.

In the middle of her fifth month in the hospital it was noted that her spleen was palpable 3 cm below the costal margin. X-rays of the chest and hands showed no changes from the previous examinations. At this time a small lymph node from the neck and a strip of skin from the leg were biopsied. The node showed findings consistent with tuberculosis. The skin from the leg showed appearances consistent with erythema induratum.

During the sixth month new skin lesions appeared, the splenic enlargement persisted and she complained for a brief period of left facial neuralgia. X-rays of the teeth, skull and sinuses were

negative. In the seventh month a palpable lymph node appeared in the right supraclavicular region. She also had occasional night sweats coincident with somewhat higher elevations of temperature. Some nonproductive cough and much abdominal distress with gaseous eructations disturbed her, but her general condition changed little. A chest plate at this time showed a change in the slope of the heart shadow. It seemed rounder, due to an increase in width across the auricles and a decrease in length. The lung fields remained about the same although the question was raised of some increased prominence of the vascular markings.

During her last month in the hospital her condition remained essentially unchanged. She was discharged, however, after eight months still febrile, but her weight and strength seemed about the same as on entry. The sinus in her neck seemed almost healed and her extremities were free from skin lesions. Her lungs were normal, the heart unchanged, the liver and spleen still palpable.

For two and a half weeks after returning home there were no developments. Then, suddenly one morning she began to complain of pain and a feeling of tightness in her chest "as if some one were sitting on her." The nurse noted that she was short of breath, that her skin was clammy and her pulse thready. When seen by her physician two hours later the attack had completely subsided and no physical abnormalities were noted. She had another similar attack the next day and a white count showed 14,000 cells. Two days later a loud friction rub could be heard over the pericardium and the following day she died.

X-RAY INTERPRETATION

DR GEORGE W. HOLMES: The obvious things are the increase in size and the change in the shape of the heart shadow seen in several of the films, also an increased brilliancy of the left lung compared with the right. I do not believe that it is due to rotation. It is not constant. It is seen in the first film but not in the last. I can only call attention to it. I do not know what it means. We expect such a change to be due to partial obstruction of the bronchus, but it is not constant. The heart lesion is definite. There is hypertrophy of the ventricles and enlargement of the auricles. There are a few small calcified glands at the lung roots. Otherwise we get no help from this examination.

DR WALTER BAUER: Do you see anything in the mediastinum suggesting glands? How about the irregular line of density mentioned in the report?

DR HOLMES: I suppose they were trying to

the atheromatous deposits in this area become calcified and feel like little shotty nodules when you palpate them at autopsy. It is seldom that these calcified masses are large enough so that one could even imagine that they would have produced narrowing of the mitral valve. In this case, however, there was so much calcification that it appeared that the mitral valve had been definitely stenosed by the calcified mass. The heart was hypertrophied, weighing 460 gm., and we found nothing to explain the hypertrophy. The spleen was normal in size, weighing only 140 gm. I find it a little hard to believe that it was felt. Spleens are seldom palpable until they reach 400 gm.

A PHYSICIAN: Was there anything in the kidneys?

DR. MALLORY: No.

CASE 24112

PRESENTATION OF CASE

First Admission A forty-three-year-old American letter carrier entered the hospital with the complaints of weakness, hematemesis and melena of one day's duration.

One year before entry he began to have nocturia two or three times a night without diurnal frequency or other urinary symptoms. About that time he began to notice slight dyspnea on climbing a flight of stairs. Eight months before entry he had an attack of severe steady, cramping pain in the left costovertebral angle which lasted about fifteen minutes and was associated with a desire but inability to move his bowels and void urine. He took some soda and vomited, with complete relief of the pain. Subsequently his urine was said to have been bloody. During the month before entry he had two other entirely similar attacks one of which was right sided. Following each of these attacks his urine was quite definitely bloody. About three weeks before entry he began to have moderately severe frontal headaches almost daily. They were relieved by Anacin tablets and were never severe enough to keep him from work. On the day before entry he had two black bowel movements. He continued his work that day but the next morning felt a little tired. That afternoon he passed another large, black, tarry stool. After supper that evening he slept for a while but was awakened by sudden epigastric distress. He felt nauseated, vomited a large amount of blood and immediately thereafter became unconscious. He had had no previous epigastric distress, nausea, hematemesis or melena, and never any jaundice. Except for the slight dyspnea mentioned above he had had no cardiorespiratory symptoms. Physical examination revealed a well-developed

and nourished, extremely pale man who was unable to respond clearly to questions. The ocular fundi showed marked narrowing and tortuosity of the arteries with numerous flame-shaped hemorrhages and white patches of exudate. The heart was slightly enlarged to the left, the rhythm was regular, and the sounds were of good quality. A_2 was greater than P_2 , and there was an apical systolic murmur. The blood pressure was 160 systolic, 90 diastolic.

The temperature was 99.5°F., the pulse 90. The respirations were 20.

The urine had a specific gravity of 1.020 with the slightest possible trace of albumin and a normal sediment. The blood showed a red-cell count of 2,000,000 with 45 per cent hemoglobin and a white-cell count of 9000 with 74 per cent polymorphonuclears. The stool gave a ++ guaiac test. The nonprotein nitrogen of the blood was 53 mg per cent and the chlorides were equivalent to 100 cc. of N/10 sodium chloride. The blood Hinton test was negative.

He was given a clysis and a transfusion of 250 cc of blood as soon as possible, and in the next three days was given four more transfusions of 250 cc each. On the day following entry his blood pressure had fallen to 112 systolic, 60 diastolic, but on the fifth day it had risen to 240 systolic, 140 diastolic. Clinically he improved rapidly on a first-stage gastric diet, and was entirely symptom free. His diet was gradually changed to solid foods and he was discharged on the thirty-seventh day in reasonably good condition with a red-cell count of 3,400,000. Repeated urine examinations during his stay in the hospital showed a maximum concentration of 1016 with the slightest possible trace to a trace of albumin and occasional casts in the sediment. On the eighteenth day the nonprotein nitrogen of the blood was 22 mg and the serum protein 5.6 gm per cent. On the day of discharge a urine concentration test gave a maximum specific gravity of 1.012, and a phenolsulfonephthalein test of kidney function showed a total excretion of 35 per cent in one hour with only 10 per cent being excreted in the first fifteen minutes. His stools had become guaiac negative ten days after entry. An x-ray of the chest taken three weeks after entry showed the heart hypertrophied in the region of the left ventricle but somewhat decreased in height. The aorta was tortuous and elongated. A gastrointestinal series done at the same time showed a normal esophagus and stomach. The first portion of the duodenum was spastic and difficult to visualize. When filled it appeared to be deformed near its apex but no ulcer crater could be demonstrated. There was a rounded mass of barium in the region of the lower jejunum which could have

DR MALLORY Yes

DR BAUER So there is a possibility that we are dealing with an individual who has, in addition to a tuberculous lymphadenopathy, Hodgkin's disease

Her manner of death I suppose is probably best explained on the basis of coronary occlusion, although I wish we had a little more information concerning it. I think it is only right to point out that if she had tuberculosis of the lymph nodes of the mediastinum and tracheobronchial nodes, direct extension to the pericardium would result in a tuberculous pericarditis with effusion. If such occurred it would be an adequate explanation for the type of exitus described. I was inclined to make a diagnosis of tuberculous adenitis involving the tracheobronchial lymph nodes with an associated erythema nodosum. There is a definite possibility of miliary tuberculosis. In view of the past history it would be safer to say that she died of coronary occlusion, but there is a possibility of the whole clinical picture including the manner of exitus being explained on the basis of tuberculosis. There is nothing in the case report to suggest the possibility of the existence of any form of lymphoma. I can go no farther.

DR MALLORY Are there any suggestions?

DR WYMAN RICHARDSON Would Dr Bauer consider a diagnosis of bacterial endocarditis?

DR BAUER In an individual with unexplained fever of this duration one should always consider it. I did not think there was much to suggest it other than the long-continued fever. It is certainly not a characteristic history of subacute bacterial endocarditis. Is there anything in the history that suggests it to you?

DR RICHARDSON I do not see how you explain the gradually increasing size of the spleen unless you think she had tuberculosis of the spleen.

DR BAUER I think there is a good possibility of such being the case.

DR RICHARDSON Then there is a suggestion that she has had difficulty with her heart.

DR BAUER Yes, she had an enlarged heart which in light of the history I believe was due to sclerosis of the coronary arteries rather than to rheumatic heart disease.

DR DONALD S KING I have an impression that erythema nodosum with miliary tuberculosis is a disease of young and not old people.

DR MALLORY Dr Goodman, can you tell us about that?

DR JOSEPH GOODMAN For the most part it occurs in younger individuals and that also holds for erythema induratum, which was the other possibility raised. The fact that there was some scarring after the skin lesions disappeared certainly is a point

against erythema nodosum. I think these lesions might also be considered papulonecrotic tubercles, which usually leave scars and small scales such as described in this case.

DR BAUER I entertained the possibility of tubercles. I thought five or six recurrent attacks were most unusual, and I also thought that some of them would probably have broken down.

A PHYSICIAN I did not know that tubercles were as painful as that.

DR GOODMAN They may be painful. They usually break down. I must admit that if they were tubercles one has to consider the description inadequate in certain respects.

CLINICAL DIAGNOSES

Tuberculous adenitis
Coronary thrombosis

DR. BAUER'S DIAGNOSES

Tuberculous adenitis
Erythema nodosum
Tuberculous pericarditis with effusion?
Coronary thrombosis?
Miliary tuberculosis?

ANATOMICAL DIAGNOSES

Pericarditis, acute fibrinous, tuberculous
Tuberculous lymphadenitis, mesenteric and bronchial
Tuberculosis of pancreas
Pulmonary tuberculosis, healed, Ghon's tubercles.
Hydrothorax, bilateral
Cardiac hypertrophy
Arteriosclerosis, slight aortic
Calcification of posterior leaflet of mitral valve.
Operative scars Cholecystectomy, appendectomy

PATHOLOGICAL DISCUSSION

DR MALLORY I do not believe I can add any more information on the skin lesions. They were quite superficial. They did not look particularly like tubercles and I inclined to erythema induratum rather than nodosum from the histological examination of a single lesion.

The autopsy showed that the cervical lymph nodes and the tracheobronchial nodes contained extensive tuberculosis. The lungs were free from it except for a calcified Ghon's tubercle. The pericardium showed an extensive pericarditis which proved to be tuberculous. There was no endocarditis and no coronary thrombosis. The coronaries were free even from atheroma. There was one peculiar finding in the heart. The commonest spot for atheroma in the body is the posterior surface of the long cusp of the mitral valve and often

does not look cachectic or show other evidences of malignancy, and cause massive gastric hemorrhages. The x-ray examination, however, gives no support to such a diagnosis whereas, on paper at least, it suggested that he might well have had a duodenal ulcer. Certainly he had very active bleeding from the stomach, and I should favor a duodenal ulcer.

We have definite evidence of hypertension and of hypertensive heart disease, characterized by an elevation in blood pressure and enlargement of the left ventricle clinically and by x-ray, although the heart is not greatly enlarged in size, it does look like a heavy heart. Then the symptoms he complained of—shortness of breath on exertion, inability to lie flat at night, and edema, seem to be due to heart failure. His vital capacity was diminished, 1700 cc., and he had rales at the lung bases. He was not showing acidosis, and his serum protein was 5.8. So I think the signs of failure were linked up with the cardiac situation.

There does seem to be evidence of chronic nephritis. The fact that he had frequency at night and not in the daytime is suggestive of nephritis. He had a high nonprotein nitrogen throughout his illness on all tests except one, which was 22. I cannot account for that one. I think we must follow the others in which it was elevated. He had a renal function of 35 per cent in one hour, only 10 per cent being excreted in the first fifteen minutes. He should have had at least 25 per cent in the first fifteen minutes, and we would expect a renal function of 50 over the course of an hour. He had retinal hemorrhages and headaches and albumin in the urine. He apparently died in uremia, and prior to death there was an acute pericarditis. I think these things seem fairly obvious from the record.

However, there does seem to be an underlying intercurrent group of symptoms that would seem to need some explanation. At the first entry we have the story of severe, steady cramping pain in the left costovertebral angle which lasted about fifteen minutes and was associated with the desire but the inability to void. Following this and following several other attacks he passed bloody urine. Then there is also a story that on one occasion he had right-sided pain and later on some lumbar pain. These facts suggest to me—though I may be reading something into the record that does not belong here—an intermittent hydronephrosis with pain, with oliguria, and with relief of pain on passing urine and in the urine there were red blood cells. If it were just from hydronephrosis, however, I do not see why he should have so much kidney damage. Another possibility we must think of is renal tumor. If he had a hypernephroma I think he probably would

have been a person who had the appearance of having cancer. He would have been cachectic. Then there is the possibility of polycystic kidneys. The reasoning would be that he had a great number of cysts in both kidneys and the renal cortex would be destroyed by pressure, causing a chronic nephritis. If the kidneys became large enough, moreover, they could become movable and therefore their weight might kink the ureters, giving a period when he would have a urinary obstruction and pain due to increased pressure within the renal pelvis. When the kink straightened out it would permit the passage of urine, and frequently such urine contains a considerable amount of blood. There is nothing said in the history of any abdominal examination so we may assume that nothing was felt, but polycystic kidneys may be missed on physical examination. There is no mention of investigation of the genitourinary tract. I feel that that group of symptoms needs some explaining, and that is the best explanation I can give for them. I have seen a few cases of polycystic kidneys and I remember two that were entirely missed because the presenting symptoms were those of hypertensive heart disease or nephritis with hypertension. I think Dr. Mintz has looked up a series of these cases here at this hospital and many patients with polycystic kidneys had hypertension. My diagnoses would be chronic nephritis with terminal uremia, acute pericarditis, hypertensive and arteriosclerotic heart disease, with congestive failure, duodenal ulcer and polycystic kidneys.

DR. TRACY B. MALLORY: It is always a good deal of a gamble to try to guess what form of renal insufficiency a patient of this sort has. Does anyone else want to hazard a diagnosis?

DR. WYMAN RICHARDSON: I would raise the question of repeated renal infarcts.

DR. MCGINN: I think that most renal infarcts are painless. I admit that should be considered.

DR. JAMES H. MEANS: I wonder if it could be vascular nephritis with intermittent bleeding and consequent variation in the urinary output.

DR. FLETCHER H. COLBY: The specific gravity is pretty high for polycystic disease.

CLINICAL DIAGNOSES

Malignant hypertension
Congestive heart failure
Uremia
Hypertensive encephalopathy
Fibrinous pericarditis
Duodenal ulcer

DR. MCGINN'S DIAGNOSES

Chronic nephritis
Hypertensive heart disease

been a diverticulum. Repeated gastrointestinal series showed a definite ulcer scar on the posterior wall of the pyloric valve. It had a crater measuring 1 cm in diameter and was thought possibly to be active.

Second Admission (nine weeks later). About a week after discharge he had gradual loss of vision over a period of one day. However, his vision improved somewhat during the next four days but remained sufficiently poor so that he had difficulty in walking alone. This condition persisted up to the time of re-entry. During the two months between entries he had gradual but steady increase in his dyspnea on exertion, and he had moderately severe headaches almost daily. On several visits to the Out Patient Department the blood pressure readings averaged 240 systolic, 150 diastolic. During the ten days before re-entry he had three or four attacks of sharp pain across the lumbar region which lasted about an hour. During each of them he felt as if he wanted to void, but did not do so. His nocturia persisted and for the week before re-entry he had voided pale-red urine. Also during the week before re-entry he had been unable to sleep lying flat because of his dyspnea. For several days he had had ankle edema. He had had no cough, hemoptysis, chills, sweats, paroxysmal nocturnal dyspnea or gastric symptoms.

Physical examination revealed a well-developed and nourished, somewhat pale man sitting up in bed in mild respiratory distress. The physical examination was essentially the same as on the previous entry except that there were diminished breath sounds, slight dullness and rales at both lung bases and some edema of both ankles. The blood pressure was 238 systolic, 154 diastolic.

The temperature was 99°F, the pulse 110. The respirations were 30.

Repeated urine examinations showed a maximum specific gravity of 1.018 and a slight trace to a large trace of albumin. Many of the specimens were loaded with red cells, and many contained a few casts. The blood showed a red cell count of 2,800,000 with a hemoglobin of 55 per cent, and a white-cell count of 9000 with 79 per cent polymorphonuclears. The guaiac test on the stool was negative. The nonprotein nitrogen of the blood was 60 mg and the protein was 5.8 gm per cent. The vital capacity was 1700 cc. An electrocardiogram showed abnormal T waves which might have been due to digitals (digitalization was started immediately on entry six days before this tracing). There was no axis deviation.

He had a very good diuresis but at the end of the first week began to hiccough and vomit frequently. At that time the nonprotein nitrogen had risen to 100 mg per cent and the CO₂ combining power of the blood was 72 vol. per cent. In spite of CO₂ inhalations he continued to hiccough and

vomit and on the fifteenth day his blood chloride was equivalent to 88 cc of N/10 sodium chloride, and his CO₂ combining power was 68.6 vol. per cent. However, his nonprotein nitrogen had fallen to 75 mg per cent. He was given several transfusions and clyses but failed to show much improvement. On the twenty-eighth day he rather suddenly became very much worse. He became semistuporous, had severe itching of the skin, shouted a good deal, was very restless and became completely blind. Four days later a pericardial friction rub could be heard and he died on the next day. A week before death the nonprotein nitrogen was 98 mg per cent.

X-RAY INTERPRETATION

DR AUBREY O HAMPTON. I do not see a definite variation from the normal in the first examination and I agree with the examiner that there was no evidence of ulcer. The second examination shows a small fleck in the region of the pyloric valve which I do not believe I would call an ulcer. It is more likely to be the pyloric valve on end.

These examinations are fifteen days apart, and I cannot imagine the pylorus being normal at the first examination and looking like a healing ulcer at the second examination. If this is an ulcer, I do not believe it had anything to do with the previous symptoms.

DR SYLVESTER MCGINN. Could they have formed another impression from fluoroscopy?

DR HAMPTON. Yes, but this is a good film of the area they were speaking of. His chest film taken two weeks before death shows obliterated costophrenic angles on both sides. There is some thickening of the pleura along the axillary lines. The lungs are clear except for apical scars. His heart is blunt in the region of the left ventricle. The decrease in height that was mentioned must mean that the heart is round in shape. It is not a dilated heart. It is hypertrophied without dilatation. I think the transverse diameter is within normal limits. It looks like the heart and aorta of hypertension.

DIFFERENTIAL DIAGNOSIS

DR MCGINN. On reading this over I felt there were certain things in the history that were at least fairly obvious. Dr Hampton's comment on the gastrointestinal series has made some of them a bit more dubious. However, in spite of his interpretation I cannot disregard the story on the first admission of the vomiting of a considerable amount of blood, and of melena. Since nothing develops to make us believe the patient had esophageal varices there are two things that could cause such a condition, a tumor of the stomach, or an ulcer. Sarcomas, in particular, may begin to produce symptoms rather abruptly, even in a man who

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NURSING EDUCATION IN NORTH ADAMS

THE *North Adams Transcript* of December 11, 1937 described an experiment which has been planned and will soon be undertaken at the North Adams Hospital to meet a community nursing need. The project presents several novel features. Its purpose is to furnish Grade A nursing care at a cost of about twenty-five dollars a week, and the School of Private Duty Nursing, now newly established, will give an intensive eighteen months course in bedside nursing. Classes will be admitted in January, April and September. The educational requirements for admission will be two years of secondary school, not more specifically described but presumably meaning two years of

ordinary high school. This project "aims to offer first-class bedside nursing care to people of modest means and at the same time provide throughout the country a livelihood to thousands of women unable to obtain a place in the economic world as self-supporting citizens."

It is emphasized that the project differs fundamentally from some suggestions made by a number of thoughtful students of nursing education elsewhere, in that its object is not to develop the inferior grade of nursing skill or subsidiary nursing service which they have recommended, but to place the "service on the highest possible level of skill and intelligence" at a distinctly lower cost. This aim is certainly praiseworthy, and if the goal can be reached, the experiment will prove to be a most welcome contribution.

The problem we have here is not new. It is the one presented by divergent views as to the best preparation for the practice of a profession. How broad and deep should the foundations be? While the Grade A nursing service is not defined, the designation suggests that it is at the highest level, commonly understood to be the highest that the nursing profession can supply. Yet a grade of nursing higher than Grade A is indicated by the statements that the "plan will not provide substitutes for highly trained professional registered nurses, whose services will be required by all local physicians as at present," and that "the school itself will open up to such nurses permanent employment as members of its faculty so to speak, for the training will be given entirely by a carefully selected and organized staff of experienced graduates in the nursing profession."

The new project takes issue sharply with the current view that the Grade A nurse should have a four-year high-school course, supplemented by three years in a school of nursing in which, whatever the content of the course, instruction should be at the collegiate level. It is commonly thought that an educational foundation of two years of high school is too narrow and superficial to bear the weight of the superstructure now required in the education of a Grade A nurse.

Congestive failure
Uremia
Fibrinous pericarditis
Duodenal ulcer
Polycystic kidneys

ANATOMICAL DIAGNOSES

Nephritis, chronic vascular, malignant
Arteriosclerosis, coronary, aortic and cerebral
Pericarditis, acute fibrinous
Cardiac hypertrophy, hypertensive type
Chronic passive congestion
Pulmonary infarct
Bronchopneumonia

PATHOLOGICAL DISCUSSION

DR MALLORY I feel quite sure polycystic disease could give every symptom this patient had. A typical clinical picture of malignant hypertension and also hematuria is not uncommon. What we found, however, was malignant vascular nephritis. The kidneys weighed 225 gm. They were rather markedly scarred on the surface with a coarser type of scarring than is usual with the ordinary benign vascular nephritis. The lesions in the blood vessels were exceptionally acute in character and they involved predominantly the intermediate-sized blood vessels, the radial arteries rather than the afferent arterioles of the glomeruli.

That is characteristic of the so-called malignant type. These cases ordinarily do not have any severe grade of hematuria but they occasionally develop quite massive hematuria. This may be unilateral, and kidneys have been removed because of it. I think his pain probably arose from the presence of clots in the pelves and ureters because we found no hydronephrosis.

DR MEANS I remember that, when I was a medical student in Dr Cabot's case history course, he stated that cases showing what was then called chronic interstitial nephritis—which was the same thing as vascular nephritis, I fancy—might give rise to renal apoplexy, so to speak, with a considerable hematuria.

DR MALLORY Yes, I think there is no question that it does occur. Exactly what the mechanism is, I do not know. There were no fresh infarcts in the kidney.

DR HAMPTON Did he have an ulcer?

DR MALLORY At the time of autopsy a very shallow depression 1 cm in diameter and 1 mm in depth was found in the first portion of the duodenum, but sections through it were negative so I do not believe it was an ulcer.

A PHYSICIAN Where did he bleed from?

DR MALLORY We found nothing to explain it. Terminally he had uremic gastritis and colitis, but I do not believe he had had them any long period of time.

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During the War, Futch served as a lieutenant-colonel in the Canadian Army Medical Corps and during the winter of 1917-1918 was in charge of the Medical Division of No. 16 Canadian General Hospital, Orpington, Kent, England. Futch's medical work was largely concerned with teaching. He did, however, contribute to medical literature, writing the sections on diabetes and gout in Osler's *Modern Medicine*. He was particularly interested in diseases of metabolism and endocrinology. A forceful, clear teacher, he will long be recalled by his students. His colleagues will remember him for his sound judgment and for his delightful, rather reserved personality. He was a man who read extensively and had a wide knowledge of world affairs. He carried on the traditions set by Osler in a worthy style.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No. 63 PARTIAL PLACENTA PREVIA

Mrs. M., a twenty-five-year-old primipara approximately thirty weeks pregnant, telephoned on January 23 at 12.30 p. m. that she had just had a discharge of blood from the vagina which she estimated at about a cupful. There was no pain. She was advised to come into the hospital immediately, no visit or examination was made at home.

There was no family history of tuberculosis, diabetes, cancer or hemorrhagic disease. She had

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measles, mumps and scarlet fever as a child, and her tonsils and appendix had been removed. Catamenia began at twelve, regular twenty-eight-day cycle, lasting five days without pain. Her last period was June 24, making the estimated date of confinement March 31. There had been a slight show of blood on January 9 which was considered to have followed coitus. At six prenatal visits her urine and blood pressure were normal.

The patient was transported to the hospital by ambulance. Upon entrance her temperature was 99.6° and pulse 80. She was a well-developed and nourished woman. The mucous membranes were not pale. Her heart was not enlarged and there were no murmurs. Her lungs were resonant throughout and there were no rales. Her pelvic measurements were normal as were her extremities. The fundus was halfway between the umbilicus and the ensiform cartilage, agreeing in size with her menstrual date. The fetal heart tones were regular and strong, rate 152. Palpation revealed the baby in breech position with the sacrum left posterior. She was still bleeding but not profusely. The uterus was soft; the patient was not in labor. Because there had been a hemorrhage and because the patient was still bleeding, even though the pregnancy was advanced only to a point where the viability of the child was extremely doubtful, vaginal examination was deemed necessary to determine the source of the bleeding. A bagging kit was prepared before the examination which revealed a cervix partially taken up and dilated about 4 cm. The edge of the placenta was felt on the left of the cervix. The membranes were already ruptured. Examination definitely increased the bleeding and it was deemed wise to insert a bag. Under nitrous-oxide anesthesia a Voorhees bag No. 5 was inserted into the uterus and placed so that it lay over the partial previa. This was done at 2.20 p. m. Labor started almost immediately. The fetal heart remained of good quality until 4.30 when it dropped below 100 where it remained until delivery. The cone of the bag appeared at the vulva at 5.20 p. m., and immediate delivery was decided upon.

Following the removal of the bag, about a pint and a half of clots were expelled. A foot was found in the vagina and a breech extraction was performed. The baby weighed 3 lb., 9 oz., breathed feebly but could not be made to cry. However, with oxygen and carbon dioxide it developed a good pink color. On account of the persistent bleeding following the birth of the baby, the entire placenta, with membranes complete, was manually removed. The uterus reacted normally and no abnormal bleeding followed. The patient's

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LIPOID PNEUMONIA

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Not only is the danger of the inhalation of oily substances used as nose drops a real one, but other agents have also been found to cause trouble, codliver oil and even cream having been involved in some of the cases reported. Consequently, mothers should be warned not to give codliver oil or other substances of a similar nature to struggling infants or to very feeble ones.

Fatal cases of pneumonia caused by the aspiration of oils have been reported in the American medical literature since 1925 in sufficient numbers to warrant the conclusion that the actual number of cases occurring must be a considerable one. The condition, according to reports, is usually observed in children under two years of age, and especially in artificially fed, poorly nourished infants, and in those with any difficulty in swallowing or breathing. The history of nasal discharge, coughing spells or asthmatic attacks frequently follows that of periodic instillations of oil into the nostrils.

These patients usually show the clinical signs and symptoms of a low-grade pneumonia, and present an x-ray picture that shows a shadow along the sternal border of the pulmonary fields. At autopsy the tissues show a foreign-body reaction with secondary bacterial invasion, and large amounts of oil are often found in the lungs. Organic oils, such as codliver oil and cream, usually

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NORFOLK

Friday, March 25, at 8 30 p m., at the Norwood Hospital, Norwood. Subject *Tovenius of Pregnancy* Instructor Foster S Kellogg Hugo B C Riemer, *Chairman*

PLYMOUTH

Tuesday, March 22, at 4 00 p m., in the Rosa Field Nurses Residence, Brockton Hospital (rear of hospital), Brockton. Subject *The Use and Misuse of Prontylin* Instructor R Cannon Elev Walter H Pulsifer, *Chairman*

DEATH

BREWIN—JOHN A. BREWIN, M.D., of 58 Forest Avenue, Everett, died March 7 He was in his sixty third year

Dr Brewin received his degree from the North Carolina Medical College in 1904, and was a fellow of the Massachusetts Medical Society and a member of the American Medical Association. He was one of the founders of Whidden Memorial Hospital, Everett, and a member of the Everett Board of Health

His widow, two sons, and a daughter survive him

MISCELLANY

CONNECTICUT NEWS

NEUROPSYCHIATRIC INSTITUTE INSTALLS LATEST DEVELOPMENT OF SCIENCE

A new Inductopyrexia, the latest contribution of science to the so-called fever treatment of certain types of diseases, has been installed at the Neuropsychiatric Institute of the Hartford Retreat. It will be used in the treatment of tabes, general paresis and other central nervous-system diseases of similar etiology This machine is the first of its kind to be installed in Connecticut and one of the first in this section of the country

ST FRANCIS HOSPITAL, HARTFORD

At the annual meeting of St. Francis Hospital in January, Dr James F Lynch was re-elected president of the medical staff for a third term. Five new directors were named to fill five vacancies caused by death during the year Dr Michael J Morrissey is one of the new directors. Among the changes and appointments in the staff positions were the following Dr N Herbert Bailey, changed from attending obstetrician to consulting obstetrician, Dr Richard C. Buckley, transferred from attending surgeon to neurosurgeon, Dr George E. Cogan, transferred from associate obstetrician to attending obstetrician, Dr Charles W O'Neil, elected assistant dermatologist Dr John F McGrath, elected assistant surgeon, Dr Martin P McCue, elected assistant physician, Dr David Gaberman, elected assistant pediatricist, Dr Joseph G Urrichio, elected clinical associate.

St. Francis Hospital was visited by fire near noon on February 3 when what bade fair to be a serious blaze in the Nurses Home was brought under control through the efficient work of the Fire Department. Three alarms were sounded in quick succession. Twenty six sleeping nurses were roused and led to safety The cost of repairing the damage will be \$7,000

HARTFORD BOARD OF HEALTH

Dr George E Cogan was re-elected president of the Hartford Board of Health at its annual meeting in January Dr Charles W Daly and Dr Cogan were appointed to the Committee on Communicable Diseases and Laboratory, Dr Cogan to the Committee on Finance and Personnel, and Dr Daly to the Committee on Public Health Nursing and Child Hygiene. A proposal was made that the city offer medical examinations to all persons connected with the handling of food in public eating places This will be discussed with the Hartford Medical Society The secretary announced that deaths in Hartford resulting from automobile accidents last year reached the low est figure since 1914

NEW INFIRMARY FOR LAUREL HEIGHTS TUBERCULOSIS SANATORIUM

A new seven story infirmary housing 140 patients and costing \$400,000 is to be built in the near future by the State Department of Public Works at Laurel Heights Tuberculosis Sanatorium in Shelton. Plans have been drawn and bids will be received in March The infirmary building will be located on the hillside, commanding a beautiful view of the Housatonic Valley, and will be constructed of brick with limestone and granite trim It will house a central heating plant to service three buildings

PNEUMONIA SERUM AVAILABLE IN TWENTY-FOUR HOUR SERVICE

The State Department of Health now furnishes a complete, twenty four hour, pneumonia service every day in the year The department also has funds available through the United States Public Health Service not only for furnishing this laboratory service but also for providing type specific antipneumococcus serum for six types of pneumonia instead of only two as heretofore. The department will furnish the serum free to Connecticut citizens upon whom payment would work a financial hardship

HOSPITAL VS HEALTH INSURANCE

Dr James R. Miller, representing the Medical Information Bureau of the Hartford County and City medical societies, recently discussed hospital and health insurance before a lay audience in that city Dr Miller explained why organized medicine is opposed to paying for the care of the sick with tax funds. He also made very clear the difference between hospital and health insurance and set forth the chief objections to the latter The *Hartford Courant* commenting on Dr Miller's address, said "If all medical associations are facing the issue as energetically as Dr Miller says is true of the Connecticut House of Delegates and are seeking an honest solution to the problem, there will be no socialized medicine in this country"

CHILD-HEALTH PROBLEMS DISCUSSED

Several eminent speakers took part in the program of the School Health Education Conference held in Hartford on January 18 Dr William W Bauer, director of the Bureau of Health and Instruction of the American Medical Association, and Dr Haven Emerson, of the College of Physicians and Surgeons, New York City, were most widely known.

puise rose to 132 during delivery but at the end of an hour had dropped to 88. No transfusion was considered necessary. The baby died about 10:56 p. m.

No laboratory work was performed on this case previous to delivery. The patient's convalescence was normal. At her discharge examination on the fourteenth day her red-blood-cell count was 4,200,000 and the hemoglobin 70 per cent. The cervix showed a slight bilateral laceration and the uterus was in third-degree retroversion, but was easily replaced in anterior position.

It is interesting to note how quickly after the initial hemorrhage a diagnosis was made and proper treatment under way. The initial hemorrhage occurred at 12:30 p. m., examination had been made and a bag inserted at 2:20 p. m. It would have been wise to have had a red count and hemoglobin made on this patient upon her arrival at the hospital, also there is no mention in the record that any attempt was made to procure a compatible donor. This routine is always a conservative procedure.

Any baby at thirty weeks has only a fifty per cent chance of living. It is quite likely that the laceration of the placenta causing initial hemorrhage and the use of the bag which may well have interfered with the baby's circulation during or lessened the chances of this premature child's survival. It is unlikely that the delivery of a child weighing 3 lb., 9 oz. through a cervix which has filled a Voorhees bag No. 5 would have harmed the infant in any way. It is possible that a Brax-Hicks slow extraction of the child after the insertion of the bag would have been more conservative. In this procedure the child's life is definitely disregarded. On the other hand, there is no question if the operator could in any way be credited for delivering this child through a cervix dilated as much as it must have been. This patient had previously had two full-term normal deliveries.

ANNUAL DIRECTORY

Under the provisions of the By-Laws the Council has ordered the publication of the Annual Directory of Officers and Fellows of the Society as of February 15, 1938. Return postcards are being sent to all Fellows of the Society, whose dues are informing them that they are entitled to a copy of the Directory and asking them to indicate whether they wish to receive it.

In order to save time the return postcard is addressed to the Boston Mailing Company, 394 Atlantic Avenue, Boston, Massachusetts.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning March 21.

BARNSTABLE

Sunday, March 27, at 4:00 p. m., at the Cape Cod Hospital, Hyannis. Subject: Early Syphilis. Instructor: C. Guy Lane. John I. B. Vail, *Chairman*.

BERKSHIRE

Thursday, March 24, at 4:30 p. m., at the House of Mercy Hospital, Pittsfield. Subject: Rheumatic Infection, Rheumatic Heart Disease. Instructor: T. Duckett Jones. Melvin H. Walker, Jr., *Chairman*.

BRISTOL SOUTH (Fall River Section)

Monday, March 21, at 4:30 p. m., at the Union Hospital, Fall River. Subject: Treatment of Burns. Instructor: Henry W. Hudson, Jr. Howard P. Sawyer and Robert H. Goodwin, *Chairmen*.

ESSEX NORTH

Friday, March 25, at 4:00 p. m., at the Lawrence General Hospital, Lawrence. Subject: Treatment of Burns. Instructor: Henry W. Hudson, Jr. John Parr, *Chairman*.

FRANKLIN

Wednesday, March 23, at 8:00 p. m., at the Franklin County Hospital, Greenfield. Subject: Some Complications of Labor Analgesics in Labor. Instructor: James C. Janney. Halbert G. Stebbins, *Chairman*.

HAMPDEN

Thursday, March 24, at 4:00 p. m., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8:00 p. m., in the Outpatient Department of the Skinner Clinic, Holyoke Hospital, Holyoke. Subject: Pneumococcus Pneumonia and Serum Therapy. Instructor: Frederick T. Lord. George D. Henderson and George L. Schadt, *Chairmen*.

HAMPSHIRE

Wednesday, March 23, at 4:15 p. m., in the Nurses Home, Cooley Dickinson Hospital, Northampton. Subject: Differential Diagnosis and Treatment of Scarlet Fever. Instructor: Edwin H. Place. Warren P. Cordes, *Chairman*.

MIDDLESEX EAST

Tuesday, March 22, at 4:00 p. m., at the Melrose Hospital, Melrose. Subject: Puerperal Sepsis. Instructor: Thomas R. Goethals. Joseph H. Fay, *Chairman*.

MIDDLESEX SOUTH

Wednesday, March 23, at 4:00 p. m., at the Cambridge Municipal Hospital, Cambridge Street, Cambridge. Subject: Bleeding in the Last Trimester of Pregnancy. Instructor: John Rock. Edmund H. Robbins, *Chairman*.

Health of the State Legislature will probably favorably report a bill for annual registration this coming week.

The present laws read that any physician opening an office must within two weeks present credentials and sign statements with the city or town clerk, and said clerk must transmit copy of the statement to the State Board of Registration within twenty four hours and both are subject to fines for not so doing. Why inconvenience 7000 and more physicians until reasonable attempts have been made to enforce this and other rigorous existing laws? How do lapses affect malpractice insurance? Would the medical profession continue to be ruggedly independent? Many other questions might be asked.

RICHARD DUTTON, M.D.

33 Avon Street, Wakefield

REPORT OF MEETING

EASTERN HAMPDEN MEDICAL ASSOCIATION

The first monthly meeting of the fifty-eighth annual session of the Eastern Hampden Medical Association was held on Wednesday evening, March 9, at the Oaks Hotel, Springfield.

Dr. Michael J. Krnichuck, of South Hadley Falls, read the paper of the evening on 'The Clinical Significance of the Cerebrospinal Fluid' which was discussed by Drs. Dickson, Boyd and Schamlian.

Case reports were rendered by Dr. R. E. Dickson, of Holyoke, and Dr. Roberta E. Neill of Springfield.

While the Society meets every month on the Thursday nearest the full moon, it was voted to change the next meeting date to Wednesday, April 13, because of conflict with the postgraduate extension lecture on Thursday, April 14.

J. JOSEPH KLAR, *Secretary-Treasurer*

NOTICES

COURSE IN OCCUPATIONAL DERMATOSES

During May, 1938, a course in Occupational Dermatoses will be given under the auspices of the Harvard School of Public Health. Lectures will be given on the clinical manifestations, etiological factors, diagnosis, treatment, insurance and legal aspects, and so forth. Clinics will be held at the Massachusetts General Hospital, and at the various insurance companies. Visits to some of the more important factories will be arranged, so that students may study industrial processes and preventive measures. The number will be limited to ten. Further information and registration blanks may be obtained from the Dean of Harvard School of Public Health, 25 Shattuck Street, Boston, Mass.

DR. CRUCHET TO HOLD CLINIC

Dr. Rene Cruchet, professor of medicine, Bordeaux, France, will hold a clinic in the Evans Memorial Auditorium, 78 East Concord Street, Boston, on Monday, March 21, at 12 o'clock noon. His subject will be Morvan's Disease in Childhood.

SPRINGFIELD DISTRICT TEACHING CLINICS

In conjunction with the state wide movement to publicize the work of the cancer clinics, a teaching clinic will be held for the members of the medical profession of the Springfield district at the Springfield Hospital on April 1 at four in the afternoon. The guest speaker, Ashley W.

Oughterson, M.D., Associate Professor of Surgery at Yale University School of Medicine, will conduct the clinic. Also, on Friday, April 5, at four in the afternoon at the Academy of Medicine in Springfield, Dr. C. C. Little of the Roscoe B. Jackson Memorial Laboratory of Bar Harbor, Maine, will be the guest speaker and his subject 'Some Recent Advances in Cancer Research'. All local members of the medical profession are cordially invited to attend both these exercises.

COURSE FOR MEDICAL RESERVE OFFICERS OF THE UNITED STATES ARMY

The Harvard Medical School, Courses for Graduates offers a course with special reference to traumatic and military surgery and medicine. The course is limited to officers holding a commission in the Medical Reserve Corps of the United States Army and will be given for two weeks beginning June 1. Attendance at this course will be given inactive duty credit by the War Department.

AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS

Of special interest to every physician and surgeon of this country is the program of the American Association of Industrial Physicians and Surgeons 1938 meeting.

To broaden the interest in industrial medicine to the end of minimizing the morbidity and mortality of working people, reducing accidents and the number of deaths or cripples resulting therefrom, removing the hazards of occupational diseases, and keeping more people on their jobs in healthy condition—all these are naturally of vital interest to the physician or surgeon in general practice.

Acquaintance with industrial medical problems such as these is increasingly important to every physician and surgeon whether he be exclusively in private practice or identified, in whatever relation, with industrial medicine. Thus he will do well to mark on his calendar June 6, 7, 8 and 9, for this meeting of the American Association of Industrial Physicians and Surgeons, which will be held concurrently with the Midwest Conference on Occupational Diseases at the Palmer House in Chicago. The field of industrial medical practice is increasingly prolific of broader opportunities and closer co-operation with physicians and surgeons in every specialty and in every locality.

CARNEY HOSPITAL

The monthly clinical meeting and luncheon of the Carney Hospital will be held on Monday, March 21, at 11:30 a.m. in the Andrew Carney Assembly Hall.

PROGRAM

Case Report: Lymphatic Leukemia. Dr. F. Ciampi. Pathology Exhibit.

Address: Coccydynia. Dr. John S. Kelley. Discussion: Dr. H. G. Lee, Dr. J. L. Doherty and Dr. M. V. Norton.

R. J. HEFFERNAN, M.D., *Secretary*

BOSTON MEDICAL HISTORY CLUB

Under the auspices of the Boston Medical History Club, Dr. W. Richard Ohler will speak on 'The Development of Our Knowledge of the Kidneys and Their Diseases' at the Boston Medical Library, 8 Fenway, Boston. The meeting will be held on Monday, March 21, at 8:15 p.m.

BENJAMIN SPECTOR, M.D., *Secretary*

MT SINAI HOSPITAL STAFF APPOINTMENTS

Mt. Sinai Hospital, Hartford, has announced its staff appointments for the year. The chief physicians are D. N. Shulman, Peter Steincrohn, and Samuel Donner. The chief surgeons are William Lechner, Louis Antupit and Joseph Heyman.

MEDICAL SOCIETY HONORS DR. STEINER

About fifty friends of Dr. Walter R. Steiner were present at a dinner in his honor at the Hartford Club on February 7. After the dinner Dr. Archibald Malloch, librarian of the New York Academy of Medicine, delivered an address before the Hartford Medical Society on "Medical Libraries." Dr. Malloch paid fitting tribute to Dr. Steiner, who has served the Society as its librarian for 35 years and for whom the Society recently named its library of 20,000 volumes. A portrait of Dr. Steiner, the gift of a friend and patient, was presented to the Society and unveiled before the assembled group of members. The fitting remarks of the president, Dr. Edward J. Whalen, added greatly to the impressiveness of the occasion.

FAIRFIELD COUNTY MEDICAL ASSOCIATION

In co-operation with the local medical societies the Fairfield County Medical Association has been conducting a series of monthly meetings in different cities of the county. On January 11 at Greenwich, Dr. George Blumer, of Yale University School of Medicine, gave a very clear and instructive talk on "Subacute Bacterial Endocarditis." On February 9, at the Norwalk Hospital, Dr. Harold M. Marvin, of New Haven, discussed "Myocardial Failure." The remainder of the program follows:

March 8, 8:30 p. m., Stamford Hall. Speaker, Dr. Clarence L. Robbins, New Haven. Subject, "Edema: Its differentiation and treatment."

April 12, 3:30 p. m., Stratfield Hotel, Bridgeport. Speaker, Dr. Harry Zimmerman, New Haven. Subject, "Vascular Diseases of the Central Nervous System."

May 12, 9 p. m., Hotel Green, Danbury. Speaker, Dr. Ashley Oughterson, New Haven. Subject, "Peripheral Vascular Disease: Its conservative treatment."

DEATHS

AXTELLE—JOHN FRANK AXTELLE, M.D., aged 83, formerly a practitioner in Hartford, died at the Masonic Home in Wallingford on February 9.

CARVER—JOHN PRESTON CARVER, M.D., aged 66, medical examiner for twenty years and general practitioner in medicine in Simsbury since 1902, died at his home, February 4, after an illness of three months. Death was said to have been due to heart disease. A native of Pelham, Massachusetts, he was the son of the late Freeman C. and Almira (Thayer) Carver. He spent most of his youth in Northampton, Massachusetts, and in 1896 was graduated from the Albany Medical College. After a postgraduate course at the New York College of Physicians and Surgeons he began practice in New Hartford and came to Simsbury in 1902. He was physician for Westminster School. His practice extended to nearby communities, and for many years he made calls, day and night, throughout the countryside. In 1898 he married Helen E. Eno, of Simsbury. Besides his widow, he has left three daughters, Mrs. Thomas Whitman, Mrs. Esther C. Standish and Miss Martha Carver, all of Simsbury, two grandchildren, a sister, Mrs. Cora Carver Larimer, and a half brother, Richard Carver, of Northampton.

KELLOGG—CLIFFORD WALCOTT KELLOGG, M.D., aged 77, well known physician, died of pneumonia on January 31 at Middlesex Hospital, Middletown, where he was taken after a two weeks' illness. Born in South Amherst, Mass., a son of the late Beulah H. and Elizabeth (Walcott) Kellogg, he moved to Hartford when a boy. He was graduated from Yale University and entered Yale University School of Medicine, graduating at the head of his class. For a year he remained as a lecturer at the school and then interned at the New Haven Hospital, where he became superintendent. His wife was the former Edith Raymond, of New Canaan, who was superintendent of nurses at the hospital when Dr. Kellogg met her. Later Dr. Kellogg entered general practice in New Haven, which he continued for a few years, and then moved to Higganum where he practiced medicine for eighteen years. In 1917 he opened an office on Washington Street, Middletown, continuing practice there until about two years ago when he retired to his home in Higganum.

Dr. Kellogg was well known for his musical and inventive talents. He wrote several Yale songs, the most popular of which was "Yale Blue Forever." He contributed many articles to medical journals and was a member of the Middletown Medical Society and the American Medical Association. Dr. Kellogg leaves four daughters, Mrs. R. L. Hayden, of Haddam, and Mrs. Patrick Doyle, Miss Margaret and Miss Dorothy Kellogg, all of Higganum, three grandchildren, and two sisters, Mrs. Louise Thayer and Mrs. Frank Brandell, both of Northampton, Massachusetts.

WEIR—LOREN RAY WEIR, M.D., aged 54, eye, ear, nose and throat specialist in New Britain during the past fifteen years, died suddenly at his home, February 10, of heart disease. Dr. Weir was born in Burnside, Illinois, and after graduating from high school entered the Hahnemann Medical School in Kansas City, Missouri, entering the practice of medicine in Lathrop, Missouri, after his graduation. He served during the World War as a lieutenant in the U. S. Army Medical Corps. In 1920 he took up a specialized study of eye, ear, nose and throat ailments, going to New Britain to specialize in 1923. He was on the staff of New Britain General Hospital, and a member of the city and county medical societies and of the South Congregational Church. He was a past master of Lathrop Lodge, A. F. & A. M., and a member of the Commandery and the Mola Shrine of St. Joseph, Missouri. He is survived by his widow, Mrs. Mae A. Weir, two brothers, Dr. C. E. Weir, of Abingdon, Illinois, and Hugh L. Weir, of Galesburg, Illinois, two sisters, Mrs. George Aldrich, of Roseville, Illinois, and Mrs. Ernest Wilke, of Charles City, Iowa, and two half brothers, Bernard and Forest Weir.

CORRESPONDENCE

THE PROPOSED BILL FOR ANNUAL REGISTRATION OF PHYSICIANS IN MASSACHUSETTS

To the Editor—In 1936, 1937 and 1938 the State Board of Registration has made determined drives to compel the medical profession to "trade in" its permanent right to practice medicine in Massachusetts for an annual permit with varying and probably increasing restrictions. The Council of the Massachusetts Medical Society has each year emphatically opposed such proposed legislation. It is surprising, therefore, to learn that the Committee on Public

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

May 5—5 p. m. New Bedford.

ESSEX SOUTH

April 6—Gloucester Hospital Gloucester Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced.

May 5—Censors meet at Salem Hospital 3.30 p. m.

May 11—Annual meeting Salem Country Club Peabody Dinner at 7 p. m. Speaker and subject to be announced.

FRANKLIN

Meeting will be held at the Franklin County Hospital Greenfield at 11 a. m. the second Tuesday of May

HAMFDEN

Meetings will be held on the fourth Tuesday in April and July

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club Stoneham at 12.15 p. m. on May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27

NORFOLK DISTRICT

March 29—Page 500.

May—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon.

April 7—At the Quincy City Hospital.

May 5—Annual meeting

PLYMOUTH

Meetings will be held at 11 a. m. on March 17 April 21 May 19 and July 21

WORCESTER

April 13—Hahnemann Hospital Worcester Dinner will be at 6.15 to be followed by business session and scientific program.

May 11—Afternoon and evening annual meeting Place and schedule of program to be announced.

BOOK REVIEWS

Cho Medica xix Pathology E. B. Krumbhaar 206 pp
New York Paul B Hoeber, Inc., 1937 \$2.00

This volume of *Cho Medica*, a series of primers on the history of medicine, concerns the history of pathology. There are eight chapters, an epilogue, two appendices, and a chronologic list of pathological milestones. The scope of the book is indicated by the titles of the eight chapters, which are as follows: 'Primitive, Classical and Medieval Concepts Pathology of Antiquity', 'Theories of the Nature of Disease', 'The Rise of Anatomic Concepts in Disease', 'Systematized Gross Pathologic Anatomy', 'Pathologic Anatomy of the Tissues and Precellular Pathology', 'Cellular Pathology', 'Integrated Pathology Structural Functional, Chemical, Experimental and Clinical Methods of Approach', 'Special Concepts Inflammation, Cancer

The author, a professor of pathology of great distinction and noted for his interest in the history of medicine, has achieved an admirable performance, and it is quite clear that he has selected his material wisely from a vast fund of knowledge. The reviewer's main criticism is that the limitation imposed by space has compelled the author to write with great economy of words, nevertheless the volume is very readable. The logical presentation and wise selection of material give the reader an easily remembered knowledge of the development of pathology, concurrently with the development of rational medicine. In spite of the condensation of material and inhibition of the author's usual flowing style, the effect of sequence is strong. The chapter "Integrated Pathology" could well have been em-

phasized at the expense of the chapter on inflammation and cancer

There will be many dissenters to Dr Krumbhaar's list of pathological milestones. In the opinion of the reviewer he has included among the worthy a few of lesser merit. A short bibliography will serve to direct the reading of persons whose interest in medical history goes beyond the scope of this volume. The reviewer highly recommends it as collateral reading for medical students in the study of pathology and is convinced that the booklet will receive the grateful reception that it deserves.

A Textbook of Medicine By American Authors. Edited by Russell L. Cecil. Fourth edition, revised and entirely reset. 1614 pp Philadelphia and London W B Saunders Company, 1937 \$9.00

This textbook of medicine needs little description because of the familiarity of students and physicians with the previous editions, which have comprised a systematic arrangement of contributions by a group of men who are masters of their particular subjects. The increase in medical knowledge since 1933 clearly justifies a new edition of this book. To a certain extent the present revision represents a new deal in that younger men have revised many of the articles on old subjects, these are consistent with the high standard of the text. Most of the 130 contributors are members of university medical schools and have presented their material in a form especially suitable for medical students. A number of entirely new topics has been introduced lymphogranuloma inguinale, several new virus infections, pneumonia in childhood, staphylococcal infections, meningococcal sepsis, spontaneous hypoglycemia, the nephroses, classification of diseases of the heart, and diseases of the peripheral vessels. The arrangement of material has not been changed to any considerable extent, though in the section on infectious diseases the various conditions have been grouped under such headings as virus diseases, streptococcal infections, bacillary diseases, and so forth. The description of any one condition is necessarily brief. Nevertheless, well-chosen references at the end of each article provide suggestions for further reading, including articles on treatment. Thus the volume, though primarily a textbook for students, should be useful to the practitioner for its succinct descriptions of conditions with which he may not happen to be familiar and for its convenient references to outstanding articles in the literature.

Diseases of the Heart Described for practitioners and students Sir Thomas Lewis. Second edition. 297 pp New York The Macmillan Company, 1937 \$3.50

The first edition of this book was published in 1933. The new edition has very few changes. These are as follows: the section on diuretics now includes salyrgan, and theophylline has been substituted for theobromine, the diuse of strophanthus is recommended, the section on constrictive pericarditis has been rewritten and surgical treatment given its proper place, more interest is shown in the removal of sympathetic ganglia in cases of angina pectoris, the carotid sinus is included under the causes of syncope, the prognosis in coronary thrombosis has been made more hopeful, there are a few minor changes in the treatment of essential hypertension, finally, a little more credit is given to the action of digitalis in cases of chronic congestion that present regular heart action, and that have been treated with all the usual methods without success." The 1933 edition said these cases *seem* to respond to full doses of digitalis." The new edition says

BOSTON UNIVERSITY MEDICAL SOCIETY

The next meeting of the Boston University Medical Society will be held in the Evans Memorial Auditorium, 78 East Concord Street, Boston, on Monday evening, March 21, at 8 o'clock

PROGRAM

Presentation of Case.

La Vie en Louisiane en 1752 (d'après un Manuscrit Bordelais Inédit) Professor Rene Cruchet, of Bordeaux, France.

STAFF MEETING OF THE MASSACHUSETTS MEMORIAL HOSPITALS

The next meeting of the staff of the Massachusetts Memorial Hospitals will be held in the Evans Memorial, 78 East Concord Street, Boston, on Friday March 25, at 8 15 p m.

PROGRAM

Case of Hemorrhagic Pericarditis. Drs R. H. Wells and M. A. Berezin.

Two Cases of Contagious Disease with Cardiac Interest. Dr Conrad Wesselhoeft.

Roentgenologic Study as an Aid in the Diagnosis of Cardiac Lesions. Dr George Levene.

Discussion Drs Paul D. White, Samuel A. Levine, Howard B. Sprague, William D. Reid and Ashton Graybiel

Luncheon will be served after the meeting. Physicians and medical students are cordially invited to attend

HELMUTH ULRICH, M.D., Secretary

NORFOLK DISTRICT MEDICAL SOCIETY

The regular meeting of the Norfolk District Medical Society will be held in the amphitheater of the Beth Israel Hospital, Brookline Avenue, Boston, on Tuesday evening, March 29, at 8 15. Telephone Beacon 4400

PROGRAM

Business

Communication Diseases of the Kidney. Medical view point by Dr Albert A. Hornor. Surgical viewpoint by Dr George C. Prather

Collation.

The next censors examination will be held May 5. Applications from graduates of Class A schools must reach the secretary four weeks prior to this date and applications from all others six weeks prior to this date.

FRANK S. CRUICKSHANK, M.D., Secretary

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, March 22, at 8 15 p m.

PROGRAM

Presentation of Cases

The Pigments and Color of Living Human Skin. Dr E. A. Edwards and Dr S. Q. Duntley

Medical students and physicians are cordially invited to attend

MARSHALL N. FULTON, M.D., Secretary

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MARCH 21

MONDAY MARCH 21

12 m. Dr. Cruchet to Hold Clinic. Evans Memorial auditorium, 78 East Concord Street Boston

8 p m. Boston University Medical Society. Evans Memorial auditorium 78 East Concord Street Boston

8 15 p m. Boston Medical History Club. Boston Medical Library 8 Fenway Boston

TUESDAY MARCH 22

*9 10 a. m. Boston Dispensary. X ray demonstration. Dr. Alice Ettinger

*10 a. m. 12 30 p m. Tumor clinic. Boston Dispensary

*8 15 p m. Harvard Medical Society. Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance)

WEDNESDAY MARCH 23

*9 10 a. m. Boston Dispensary. Hospital case presentation. Dr. S. J. Thannhauser

*12 m. Clinicopathological conference. Children's Hospital amphitheater

THURSDAY MARCH 24

8 30-9 30 a. m. Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals held this week at the Peter Bent Brigham Hospital

*9 10 a. m. Boston Dispensary. Some Practical Considerations of Muscle Imbalance. Dr. Joseph J. Skirball

FRIDAY MARCH 25

*9 10 a. m. Boston Dispensary. Some Aspects of Pneumonia Therapy. Dr. Maxwell Finland

10 a. m. 12 30 p m. Tumor clinic. Boston Dispensary

*8 15 p m. Staff meeting of the Massachusetts Memorial Hospitals, Evans Memorial 78 East Concord Street Boston.

SATURDAY MARCH 26

*9 10 a. m. Boston Dispensary. Hospital case presentation. Dr. S. J. Thannhauser

*10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian

SUNDAY MARCH 27

4 p m. Illustrated public health lecture. Faulkner Hospital auditorium. Hay Fever and Asthma. Dr. Walter S. Burrage.

4 p m. Free public lecture. Harvard Medical School amphitheater of Building D. Arthritis. Dr. Walter Bauer

Open to the medical profession

MARCH 17—Boston Society of Psychiatry and Neurology. Boston Medical Library 8 Fenway Boston at 8 15 p m.

MARCH 18—Sir William Osler Society. auditorium of the Beth Israel Hospital at 8 p m.

MARCH 21—Boston Medical History Club. Page 499

MARCH 21—Boston University Medical Society. Notice above

MARCH 21—Carney Hospital. Page 499

MARCH 21—Dr. Cruchet to Hold Clinic. Page 499

MARCH 22—Harvard Medical Society. Notice above

MARCH 25—Staff meeting of the Massachusetts Memorial Hospitals. Notice above

MARCH 28. APRIL 1—Postgraduate Institute of the Philadelphia County Medical Society. Page 282. Issue of February 10

APRIL 1-8—Springfield District Teaching Clinics. Page 499

APRIL 5—Greater Boston Medical Society. 8 30 p m. auditorium of Beth Israel Hospital Boston

APRIL 4-8—The American College of Physicians. Page 41. Issue of July 1

APRIL 13—Eastern Hampden Medical Association. Page 499

APRIL 14—Pentucket Association of Physicians. Hotel Bartlett 95 Main Street Haverhill 8 30 p m.

APRIL 18, 19 and 20—Thomas William Salmon Memorial Lectures. Page 499. Issue of March 10

APRIL 26—New England Society of Psychiatry. Page 322. Issue of February 17

MAY 31. JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society. Hotel Bradford Boston

JUNE 6, 7, 8 and 9—American Association of Industrial Physicians. Page 499

JUNE 13-17—American Medical Association. San Francisco.

JUNE 13. OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology. Page 282. Issue of February 10

OCTOBER 17-21—Clinical Congress of the American College of Surgeons. New York City

OCTOBER 24-26—Academy of Physical Medicine. Scientific Session. Washington D C

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

May 5—5 p. m. New Bedford.

ESSEX SOUTH

April 6—Gloucester Hospital Gloucester Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced.

May 5—Censors meet at Salem Hospital 3.30 p. m.

May 11—Annual meeting Salem Country Club Peabody Dinner at 7 p. m. Speaker and subject to be announced.

FRANKLIN

Meeting will be held at the Franklin County Hospital Greenfield at 11 a. m. the second Tuesday of May

HAMPTON

Meetings will be held on the fourth Tuesday in April and July

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club Stoneham at 12.15 p. m. on May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club, Lowell on April 27

NORFOLK DISTRICT

March 29—Page 500.

May—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon.

April 7—At the Quincy City Hospital.

May 5—Annual meeting.

PLYMOUTH

Meetings will be held at 11 a. m. on March 17 April 21 May 19 and July 21

WORCESTER

April 13—Hahnemann Hospital Worcester Dinner will be at 6.15 to be followed by business session and scientific program.

May 11—Afternoon and evening annual meeting Place and schedule of program to be announced.

BOOK REVIEWS

Clio Medica. xix Pathology E. B. Krumbhaar 206 pp
New York Paul B. Hoeber, Inc., 1937 \$2.00

This volume of *Clio Medica*, a series of primers on the history of medicine, concerns the history of pathology. There are eight chapters, an epilogue, two appendices, and a chronologic list of pathological milestones. The scope of the book is indicated by the titles of the eight chapters, which are as follows: "Primitive, Classical and Medieval Concepts Pathology of Antiquity", "Theories of the Nature of Disease", "The Rise of Anatomic Concepts in Disease", "Systematized Gross Pathologic Anatomy", "Pathologic Anatomy of the Tissues and Precellular Pathology", "Cellular Pathology", "Integrated Pathology Structural Functional, Chemical, Experimental and Clinical Methods of Approach", "Special Concepts Inflammation, Cancer".

The author, a professor of pathology of great distinction and noted for his interest in the history of medicine, has achieved an admirable performance, and it is quite clear that he has selected his material wisely from a vast fund of knowledge. The reviewer's main criticism is that the limitation imposed by space has compelled the author to write with great economy of words, nevertheless the volume is very readable. The logical presentation and wise selection of material give the reader an easily remembered knowledge of the development of pathology, concurrently with the development of rational medicine. In spite of the condensation of material and inhibition of the author's usual flowing style, the effect of sequence is strong. The chapter "Integrated Pathology" could well have been em-

phasized at the expense of the chapter on inflammation and cancer.

There will be many dissenters to Dr. Krumbhaar's list of pathological milestones. In the opinion of the reviewer he has included among the worthy a few of lesser merit. A short bibliography will serve to direct the reading of persons whose interest in medical history goes beyond the scope of this volume. The reviewer highly recommends it as collateral reading for medical students in the study of pathology and is convinced that the booklet will receive the grateful reception that it deserves.

A Textbook of Medicine By American Authors Edited by Russell L. Cecil. Fourth edition, revised and entirely reset. 1614 pp Philadelphia and London W. B. Saunders Company, 1937 \$9.00

This textbook of medicine needs little description because of the familiarity of students and physicians with the previous editions, which have comprised a systematic arrangement of contributions by a group of men who are masters of their particular subjects. The increase in medical knowledge since 1933 clearly justifies a new edition of this book. To a certain extent the present revision represents a "new deal" in that younger men have revised many of the articles on old subjects, these are consistent with the high standard of the text. Most of the 130 contributors are members of university medical schools and have presented their material in a form especially suitable for medical students. A number of entirely new topics has been introduced: lymphogranuloma inguinale, several new virus infections, pneumonia in childhood, staphylococcal infections, meningococcal sepsis, spontaneous hypoglycemia, the nephroses, classification of diseases of the heart, and diseases of the peripheral vessels. The arrangement of material has not been changed to any considerable extent, though in the section on infectious diseases the various conditions have been grouped under such headings as virus diseases, streptococcal infections, bacillary diseases, and so forth. The description of any one condition is necessarily brief. Nevertheless, well chosen references at the end of each article provide suggestions for further reading, including articles on treatment. Thus the volume, though primarily a textbook for students, should be useful to the practitioner for its succinct descriptions of conditions with which he may not happen to be familiar and for its convenient references to outstanding articles in the literature.

Diseases of the Heart Described for practitioners and students Sir Thomas Lewis. Second edition. 297 pp New York The Macmillan Company, 1937 \$3.50

The first edition of this book was published in 1933. The new edition has very few changes. These are as follows: the section on diuretics now includes salyrgan, and theophylline has been substituted for theobromine, the diuse of strophanthus is recommended, the section on constrictive pericarditis has been rewritten and surgical treatment given its proper place, more interest is shown in the removal of sympathetic ganglia in cases of angina pectoris, the carotid sinus is included under the causes of syncope, the prognosis in coronary thrombosis has been made more hopeful, there are a few minor changes in the treatment of essential hypertension, finally, a little more credit is given to the action of digitalis in "cases of chronic congestion that present regular heart action, and that have been treated with all the usual methods without success. The 1933 edition said these cases "seem to respond to full doses of digitalis." The new edition says

BOSTON UNIVERSITY MEDICAL SOCIETY

The next meeting of the Boston University Medical Society will be held in the Evans Memorial Auditorium, 78 East Concord Street, Boston, on Monday evening, March 21, at 8 o'clock

PROGRAM

Presentation of Case.

La Vie en Louisiane en 1752 (d'après un Manuscrit Bor delais Inédit) Professor Rene Cruchet, of Bordeaux, France.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MARCH 21

MONDAY MARCH 21

- 12 m Dr Cruchet to Hold Clinic Evans Memorial auditorium, 78 East Concord Street Boston
8 p m Boston University Medical Society Evans Memorial auditorium 78 East Concord Street Boston
8 15 p m Boston Medical History Club Boston Medical Library 8 Fenway Boston

TUESDAY MARCH 22

- *9-10 a m Boston Dispensary X ray demonstration Dr Alice Ettlinger
*10 a m 12 30 p m Tumor clinic Boston Dispensary
*8 15 p m Harvard Medical Society Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance)

WEDNESDAY MARCH 23

- *9 10 a m Boston Dispensary Hospital case presentation. Dr S. J. Thannhauser
*12 m Clinicopathological conference. Children's Hospital amphitheater

THURSDAY MARCH 24

- 8 30-9 30 a m Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals, held this week at the Peter Bent Brigham Hospital
*9 10 a m Boston Dispensary Some Practical Considerations of Muscle Imbalance. Dr Joseph J. Skirball

FRIDAY MARCH 25

- 9 10 a m Boston Dispensary Some Aspects of Pneumonia Therapy Dr Maxwell Pinland
*10 a m 12 30 p m Tumor clinic. Boston Dispensary
*8 15 p m Staff meeting of the Massachusetts Memorial Hospitals, Evans Memorial 78 East Concord Street Boston.

SATURDAY MARCH 26

- *9 10 a m Boston Dispensary Hospital case presentation Dr S. J. Thannhauser
*10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A. Christian

SUNDAY MARCH 27

- 4 p m Illustrated public health lecture, Faulkner Hospital auditorium Hay Fever and Asthma Dr Walter S. Burrage.
4 p m Free public lecture. Harvard Medical School amphitheater of Building D Arthritis. Dr Walter Bauer
Open to the medical profession

NORFOLK DISTRICT MEDICAL SOCIETY

The regular meeting of the Norfolk District Medical Society will be held in the amphitheater of the Beth Israel Hospital, Brookline Avenue, Boston, on Tuesday evening March 29, at 8 15 Telephone Beacon 4400

PROGRAM

Business.

Communication Diseases of the Kidney Medical view point by Dr Albert A. Hornor Surgical viewpoint by Dr George C. Prather
Collation.

The next censors examination will be held May 5 Applications from graduates of Class A schools must reach the secretary four weeks prior to this date and applications from all others six weeks prior to this date.

FRANK S. CRUICKSHANK, M.D., Secretary

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), Tuesday, March 22, at 8 15 p m

PROGRAM

Presentation of Cases.

The Pigments and Color of Living Human Skin Dr E. A. Edwards and Dr S. Q. Duntley

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., Secretary

- MARCH 17—Boston Society of Psychiatry and Neurology Boston Medical Library 8 Fenway Boston at 8 15 p m
MARCH 18—Sir William Osler Society auditorium of the Beth Israel Hospital at 8 p m
MARCH 21—Boston Medical History Club Page 499
MARCH 21—Boston University Medical Society Notice above
MARCH 21—Carney Hospital Page 499
MARCH 21—Dr Cruchet to Hold Clinic Page 499
MARCH 22—Harvard Medical Society Notice above.
MARCH 25—Staff meeting of the Massachusetts Memorial Hospitals. Notice above
MARCH 28 APRIL 1—Postgraduate Institute of the Philadelphia County Medical Society Page 282 issue of February 10
APRIL 1 8—Springfield District Teaching Clinics. Page 499
APRIL 5—Greater Boston Medical Society 8 30 p m auditorium of Beth Israel Hospital Boston
APRIL 4-8—The American College of Physicians Page 41 issue of July 1
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NUMBER 12

SULFANILAMIDE A REVIEW

MAURICE A. SCHNITZER, M.D.*

BOSTON

IT is now approximately three years since the new chemotherapeutic agent, prontosil, for the treatment of infections due to streptococci was presented to the medical profession. Whenever a new measure is introduced in therapeutics it is appropriate, after the accumulation of sufficient data, to review the evidence for and against its use, to learn especially the best method of application, and, most of all, to ascertain its limitations. In the case of sulfanilamide, the active principle derived from prontosil, this is particularly true because of the immediate enthusiasm with which it has been accepted.

Published articles on prontosil and its derivatives, including sulfanilamide, have been so numerous as to make it difficult to keep abreast of the subject. In fact, since Domagk's¹ original article, which appeared February 15, 1935, and which introduced prontosil for the treatment of hemolytic streptococcal infections in mice, two hundred and fifteen articles† on the subject had been published up to November 1, 1937. To be sure, it is still too early to evaluate all the possibilities and potentialities of this drug and to draw any far-reaching conclusions. Yet enough has been learned about its value in the treatment of certain conditions, the diseases in which its use has been unsuccessful and its definite toxic effects to warrant a brief résumé.

CHEMISTRY

The azo dyes, from which prontosil and sulfanilamide are derived, have been utilized in the textile industry for the past twenty-five years as dyes for cotton, wool and silk. In this industry it has been known for a long time that azo dyes form an intimate combination with the cellular protein. While studying this interesting phenomenon, Eisenberg² tested the behavior of one of these dyes, chrysoidin, on bacteria *in vitro*, and found it to have a strong bactericidal action. It was thus in-

troduced as a chemotherapeutic agent, and subsequently various other azo compounds, trypan blue and so forth, were tried, particularly as urinary disinfectants, but with equivocal therapeutic results.

In 1932 Meitzsch and Klarer, while investigating chrysoidin, synthesized a chloride of the sulfonamide of chrysoidin, producing 4-sulfamido-2,4-diaminoazobenzene hydrochloride.‡ This was a red crystalline powder, slightly soluble in water, with a melting point of from 247 to 251°C. It was this substance that Domagk demonstrated in 1935 as exerting a protective action when given intravenously to mice infected with streptococci. He called the substance prontosil.

Unfortunately there are three substances with the name prontosil, and this has caused much confusion in the medical literature. The first is the monohydrochloride synthesized by Meitzsch and Klarer. The second is the dihydrochloride (4-sulfamido-2,4-diaminoazobenzene dihydrochloride) which is slightly more soluble in water and is just as effective. The dihydrochloride is also known as Prontosil Flavum, Prontosil Tablets and Rubiazol (a French preparation). The third prontosil is the disodium sulfonate salt (4-sulfamidobenzene-2-azo-1-hydroxy-7-acetyl-amino-naphthalene-3,6-disodium sulfonate). The dihydrochloride salt is commonly used in Europe, the red prontosil solution employed in this country is the disodium salt in 25 per cent solution. This is also known as Prontosil Red, Prontosil Soluble, Prontosil S and Prontosil Solution. There was immediate and widespread interest in the use of these substances in both human and experimental infections caused by streptococci. In general the results were favorable.

The next important development came from Tréfouël, Tréfouël, Nitti and Bovet.³ In their experimental work with prontosil they demonstrated that the azo linkage was not necessary in the molecule, but that the substance probably responsible for the

*Resident physician, Peter Bent Brigham Hospital; assistant in medicine, Harvard Medical School.

†Courtesy of Winthrop Chemical Company and American Chemical Society.

‡Deutsches Reich Patent 607537 of Dec. 25, 1932 and additional patents, D. R. P. 610340 of Dec. 1, 1933 and D. R. P. 635701 of Apr. 19, 1934.

they "respond to full doses of digitalis" No changes have been made in the fundamental setup of the work and the paging throughout remains the same.

The book was written for the medical student who knows too much of the electrocardiogram and modern cardiologic terminology and not enough of symptoms and signs and the working classification of heart disease. It was meant to appeal likewise to the practitioner who knows too little of the modern concepts. For both these groups the book has much to offer, and by many it is considered ideal for their needs.

The American cardiologists, however, are not satisfied because they believe that too much emphasis is placed on congestion of the systemic veins and obvious cardiac failure with no acceptance of what they believe to be the fundamental concept of left ventricular failure without the accompanying failure of the right heart. To them this is a fundamental error both from the physiologic and the practical standpoint. They have long maintained that the practitioner should be taught to recognize left ventricular failure and treat patients effectively at this stage, and often prevent the failure of the right heart. In the present work the emphasis on congestion of the cervical veins is so great that the practitioner is apt to consider it the one thing for which he should look, whereas to the American cardiologist this is a late manifestation of disease and not an early one.

The second criticism of the original edition was that it gave too little place to the use of digitalis in cases where the cardiac rhythm was regular. As noted above, this criticism will be slightly modified by the changes in the new edition, but there is still no mention of its use in left ventricular failure.

So in spite of grateful appreciation for the simplified handling of the details of modern cardiologic lore, and admiration for the authors' remarkable clarity in the presentation of his conclusions, the majority of American cardiologists will continue to recommend the book with reservations.

Diseases of the Nervous System in Infancy, Childhood and Adolescence Frank R Ford. 953 pp Springfield and Baltimore Charles C Thomas, 1937 \$8.50

This textbook about the diseases of the nervous system in infancy, childhood and adolescence has all the advantages and equally all the disadvantages of any textbook. In addition, it has a distinctly local, not to say provincial, flavor. This is perhaps inherent in any textbook that has its source in a large teaching center of medicine, and provided that the academic trends there are good and that the book mirrors those trends correctly, it is a useful attribute.

Rightly or wrongly the Johns Hopkins group is credited with a tendency toward the investigation of and interest in the unusual and bizarre in medicine. Certainly the detailed and up-to-date consideration of the more uncommon types of nervous diseases in this book and the corresponding sketchy and antiquated presentation of the more common everyday analogous abnormalities bear out this belief. As is to be expected, the author emphasizes the congenital origin of central nervous-system changes wherever possible and has plumped wholeheartedly for the Hopkins school of thought in regard to the surgical lesions. The section on brain tumors is to be especially commended even if nothing more has been done than the simplified presentation of the problem. Other sections, of more interest perhaps to the general practitioner, do not conform to this high standard. In speaking of brain abscess, for example, the statement is made on page 400

that in acute abscesses which are not encapsulated, no treatment is of any avail." King's brilliant work in the therapy of this encephalitic type of abscess cannot be dismissed in such a summary fashion without critical comment. So, too, in the section on bladder physiology no mention is made or reference given to Denny Brown and Robertson's classical work on this organ or to Munro's studies of normal and abnormal cystometrograms. Tidal drainage is not referred to throughout the book. The making of electromyograms in the differential diagnosis of many of the strictly neuromuscular conditions is omitted, recent work on the carotid sinus reflex and on subdural hematomas has been overlooked, and finally, the important modern conception of migraine as a member of the so-called epileptic syndrome has been entirely neglected. As in many other sections but particularly in that devoted to 'Epilepsy and the Paroxysmal Disorders,' the references as well as the text are already out of date. The reviewer classified the references under all sections on epilepsy and found that there were only one 1937, one 1934, two 1932, and six 1931 references. Including 1930 and going as far back as 1901, however, there were 63 references. No one would seriously contend that significant work on this convulsive state all but came to an end after 1930.

On the whole, however, the book will serve its purpose in the same way that any textbook does that is, as a starting point from which the reader can, if he likes, go farther in his investigations, as a place to find out the name of the strange diseases that one sees once in a lifetime, and as an attractively written and presented exposition of the Hopkins' school of thought. In the next edition, however, it is to be hoped that the author will bring the sections dealing with the commoner central nervous-system affections of infancy and childhood up to date and make them representative of a wider point of view.

Malnutrition the Medical Octopus John Preston Sutherland 368 pp Boston Meador Publishing Company, 1937 \$3.00

This volume presents the convictions of a well known former member of the Faculty of the Boston University School of Medicine who has made a careful study of the problems incident to malnutrition, together with many quotations which are used to fortify the claims set forth. Beginning with fetal life the contention is made that the subsequent health conditions of the individual depend to a large degree on the mother's dietary habits, and in the succeeding chapters the author places the responsibility for much of the ill health and susceptibility to diseases on the use of cows' milk, meat, white flour and granulated sugar.

With the elimination of these condemned articles from the diet and the use of fruits, nuts, berries, unprocessed cereals and a wide range of vegetables one will be able to do more and better work, live longer and be less likely to contract disease, citing the author's experience along this line for thirty-eight years as evidence.

The well known facts relating to beriberi and pellagra, as deficiency diseases, lead to the assumption that cancer may be included in this category by the author.

At the end of the book there is presented a complete list of approved foods which may be a guide to those who share the author's views.

The opinions expressed in this volume are clearly and forcefully presented, but, in many respects, are at variance with the generally accepted views of the medical profession.

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⁴Deutsches Reich Patent 607537 of Dec. 25, 1932 and additional patents, D. R. P. 610320 of Dec. 1, 1933 and D. R. P. 635701 of Apr. 19, 1934.

action of the chemical was para-aminobenzenesulfonamide. Shortly thereafter Colebrook, Buttle and O'Meara,⁴ and Fuller⁵ in England, and Bliss and Long⁶ in the United States demonstrated that prontosil is probably broken down to para-aminobenzenesulfonamide in the human organism. This is now considered the effective agent. This pertinent fact has prompted the Council of Pharmacy and Chemistry of the American Medical Association⁷ to accept para-aminobenzenesulfonamide as an active chemotherapeutic substance in the treatment of infections due to hemolytic streptococci. Because this and related compounds were appearing on the market under a great variety of different names, the council selected "sulfanilamide" as the accepted name.⁸

Sulfanilamide is also used under the nomenclature of Prontosil Album and Prontylin. It is a white crystalline substance, readily soluble in hot water, hot alcohol and cold acetone, only slightly soluble in cold water and cold alcohol, and insoluble in ether, benzene and chloroform. It is neutral to litmus in an aqueous solution. For clinical purposes sulfanilamide has the desirable qualities of being easily administered and absorbed, when given by mouth, and is relatively inexpensive and of low toxicity.

MODE OF ACTION

When sulfanilamide is administered to mice immediately after experimental infection, it has a protective action so long as the chemical is given. It may protect the animal from several thousand minimal lethal doses of streptococci. If administration of the drug is delayed for several hours, however, or if the treatment is stopped before the animal recovers, it invariably dies. This demonstrates a bacteriostatic (growth-arresting) effect on the organism, although the exact site and mode of action are still unknown. Such an effect on streptococci in vitro has been shown in many experiments. A strongly bactericidal (organism-destructive) action has not been demonstrated in vitro or in vivo, except perhaps in the urine. Bliss and Long⁹ believe that sulfanilamide acts by inhibiting the growth of hemolytic streptococci, perhaps injuring the organisms in such a way as to permit them to be phagocytosed by the white blood cells. Leukocytes are essential in the action of this drug, but whether its effects are primarily on the bacteria or on the white blood cells has not been determined.

Various other hypotheses have been advanced to explain the mode of action of sulfanilamide. These include injury to the capsule of the organism, inhibition of toxin formation and specific activation of the reticuloendothelial system. The protective

action of the blood following sulfanilamide administration may be supplemented by that of the tissues of the whole animal, as suggested by Colebrook, Buttle and O'Meara.⁴ This notion of body immunity as a factor is further suggested by recent observations that, while first infections of gonorrhea do not respond to the treatment, after an individual has had the disease for a time, good therapeutic results may be obtained.

EFFECTS ON BODY TISSUES

Until the accidental deaths caused in October, 1937, by sulfanilamide in diethylene glycol solution (Elixir of Sulfanilamide—Massengill), little study has been made of the organs of animals purposely killed by this drug. Hawking¹⁰ gave toxic doses of sulfanilamide to rabbits and cats, and in those that recovered he found no histologic changes in the liver, kidneys or other viscera. Those animals which died from very large doses showed slight degenerative changes in the central nervous system in the form of chromatolysis in neurons of the anterior columns of the spinal cord, and in some of the nerve cells of the cortex and midbrain. In mice, Hageman¹¹ found some hemosiderin deposition in the spleen and slightly increased eosinophilia in the bone marrow.

Sulfanilamide could not be blamed as the cause of death in the patients who died after taking Elixir of Sulfanilamide. Necropsies and animal experiments showed that the cause was the diethylene glycol used as a vehicle. In the control studies on this problem done by Cannon,¹² two dogs and four rats were given sulfanilamide alone to see whether any tissue changes occurred. One dog and none of the rats experienced toxic manifestations. Autopsy revealed slight microscopic changes in the kidneys, consisting of moderate fatty degeneration in some of the collecting tubules of the dogs, but minimal in the rats. The livers of both dogs and rats showed no hydropic degeneration and practically no fatty changes. Sufficient observations on the organs of patients dying after sulfanilamide had been administered have not appeared. Although many of the clinical results reported following sulfanilamide treatment have been striking, its effect on body tissues in terms of late pathologic changes caused by this drug remains for the future to disclose.

CLINICAL USE

At present the clinical use of sulfanilamide is necessarily almost wholly empirical because the site and exact mode of action are not known. In the human subject, by any route of administration, the drug is readily absorbed and quickly diffused through the tissues. In this respect it is

similar to alcohol and urea¹³ Because of its ready diffusibility it attains a wide distribution, having been found in the cerebrospinal fluid, pleural fluid, prostatic secretion, saliva, pancreatic juice and bile in concentrations slightly lower than that of blood. On the other hand, the heart muscle, skeletal muscle, liver, lung and spleen contain a concentration nearly equivalent to that of the blood, whereas the skin and brain contain less, and bone and fat only small amounts. This information has encouraged the use of the drug in practically all types of inflammation involving the above secretions and due to causes even far removed from the original intention, in other words, as a therapeutic agent in infections due to hemolytic streptococci. For clinical use, the Council of Pharmacy and Chemistry has accepted sulfanilamide only for the treatment of infections due to beta-hemolytic streptococci of Lancefield's serologic Group A, although it has been found to be effective against a few other organisms.⁷

Certain observations have been of the greatest importance in establishing a rational basis for the treatment of infected human subjects. Unless the illness is critical and treatment must therefore be begun promptly, it is advisable to isolate and identify the infecting organism first, and with it test the effect of the drug in vitro. The action of the drug is better in vivo than in vitro, particularly against virulent strains of hemolytic streptococci, consequently, if sulfanilamide is effective in vitro, good clinical results may be expected.¹⁴ Evidence for this is the fact that in beta-hemolytic streptococcal infections in human beings where treatment with sulfanilamide failed, subsequent in vitro experiments with the isolated organism have shown the drug to be ineffective as a bacteriostatic agent.

A level of from 7 to 10 mg of sulfanilamide per 100 cc. of blood is optimum in obtaining the desired therapeutic effect. Little may be expected if the blood level is less than 5 mg per cent. The rate of absorption of the drug from the gastrointestinal tract or from muscle is quite rapid, occurring within three to five hours. When given subcutaneously the dye may appear in the urine in fifteen minutes. Balance studies done on human subjects¹⁵ indicate considerable individual variation, but in general when the drug is given in divided doses it takes from two to three days to establish equilibrium between the amount ingested and the amount excreted, when it has been discontinued, it takes about the same length of time to free the organism of the chemical. With normal kidneys, the drug is excreted almost wholly in the urine. In the case of decreased renal function, urinary excretion is diminished, and continued administra-

tion of sulfanilamide results in its accumulation in the body. Furthermore, toxic effects are not uncommon. These principles are necessary guides in the use of sulfanilamide in the treatment of human infections.

Method of Determination in Blood and Urine The determination of the quantity of sulfanilamide in blood, urine and body fluids is advisable in every case where this drug is used. The method, originally devised by Marshall et al¹⁵ is simple enough for routine clinical use.

Procedure for Blood Two cubic centimeters of oxalated whole blood is measured into a flask and laked with 16 cc. of 0.05% aqueous solution of saponin. Shake and allow to stand for 2 minutes. Add 2 cc. of 20% trichloroacetic acid, shake, allow to stand 1 minute, and filter. Ten cubic centimeters of the filtrate is measured into a small flask and 1 cc. of 0.1% sodium nitrite solution that has been freshly prepared is added. Allow to stand 3 minutes, then add 5 cc. of a solution of dimethyl-alpha naphthalamine (1 cc. of concentrated dimethyl-alpha naphthalamine dissolved in 250 cc. of 95% of ethyl alcohol). The result will be a purplish red azo dye, the amount of color produced being directly proportional to the amount of sulfanilamide present in the fluid analyzed.¹⁶ Compare with standard.

Procedure for Urine Dilute 1 cc. of urine to a 60-cc. volume with distilled water. Measure 10 cc. into a flask and add 1 cc. of 20% trichloroacetic acid and 1 cc. of 0.1% sodium nitrite, and allow to stand for 3 minutes. Add 5 cc. dimethyl-alpha naphthalamine (1 cc. in 250 cc. of 95% of ethyl alcohol). After 10 minutes, compare with standard.

Standard Add 1 mg sulfanilamide to 18 cc. of 20% trichloroacetic acid and make to a volume of 100 cc. with distilled water. Treat 10 cc. of this solution exactly as outlined under blood. Place in a Duboscq colorimeter cup with vernier scale at 20 mm. and compare the unknown.

Calculation

$$\frac{20}{X} = \text{mg per cent sulfanilamide, where 'X'}$$

is the reading of the unknown.

If the solution of blood or urine contains too large a quantity of chromogen for comparison, the appropriate dilution or filtrate can be made.

Oral Administration The method of choice in the administration of sulfanilamide is by mouth. With this method it is usually easiest to maintain the blood level at from 7 to 10 mg per cent. Sulfanilamide, or prontosil, is put up in tablet form, 0.3 gm (5 gr) and 0.5 gm (7.5 gr), mixed with an excipient for oral use. The daily dose for the average human adult has been expressed in terms of body weight, 0.1 gm per kilogram or 1 gm for each 20 lb, but regardless of weight, the total dose per day should not exceed 5 gm., as toxic effects may result. In children, to maintain the optimum blood level 0.15 gm per kilogram of

action of the chemical was para-aminobenzenesulfonamide. Shortly thereafter Colebrook, Buttle and O'Meara,⁴ and Fuller⁵ in England, and Bliss and Long⁶ in the United States demonstrated that prontosil is probably broken down to para-aminobenzenesulfonamide in the human organism. This is now considered the effective agent. This pertinent fact has prompted the Council of Pharmacy and Chemistry of the American Medical Association⁷ to accept para-aminobenzenesulfonamide as an active chemotherapeutic substance in the treatment of infections due to hemolytic streptococci. Because this and related compounds were appearing on the market under a great variety of different names, the council selected "sulfanilamide" as the accepted name.⁸

Sulfanilamide is also used under the nomenclature of Prontosil Album and Prontylin. It is a white crystalline substance, readily soluble in hot water, hot alcohol and cold acetone, only slightly soluble in cold water and cold alcohol, and insoluble in ether, benzene and chloroform. It is neutral to litmus in an aqueous solution. For clinical purposes sulfanilamide has the desirable qualities of being easily administered and absorbed, when given by mouth, and is relatively inexpensive and of low toxicity.

MODE OF ACTION

When sulfanilamide is administered to mice immediately after experimental infection, it has a protective action so long as the chemical is given. It may protect the animal from several thousand minimal lethal doses of streptococci. If administration of the drug is delayed for several hours, however, or if the treatment is stopped before the animal recovers, it invariably dies. This demonstrates a bacteriostatic (growth-arresting) effect on the organism, although the exact site and mode of action are still unknown. Such an effect on streptococci *in vitro* has been shown in many experiments. A strongly bactericidal (organism-destructive) action has not been demonstrated *in vitro* or *in vivo*, except perhaps in the urine. Bliss and Long⁹ believe that sulfanilamide acts by inhibiting the growth of hemolytic streptococci, perhaps injuring the organisms in such a way as to permit them to be phagocytosed by the white blood cells. Leukocytes are essential in the action of this drug, but whether its effects are primarily on the bacteria or on the white blood cells has not been determined.

Various other hypotheses have been advanced to explain the mode of action of sulfanilamide. These include injury to the capsule of the organism, inhibition of toxin formation and specific activation of the reticuloendothelial system. The protective

action of the blood following sulfanilamide administration may be supplemented by that of the tissues of the whole animal, as suggested by Colebrook, Buttle and O'Meara.⁴ This notion of body immunity as a factor is further suggested by recent observations that, while first infections of gonorrhea do not respond to the treatment, after an individual has had the disease for a time, good therapeutic results may be obtained.

EFFECTS ON BODY TISSUES

Until the accidental deaths caused in October, 1937, by sulfanilamide in diethylene glycol solution (Elixir of Sulfanilamide—Massengill), little study has been made of the organs of animals purposely killed by this drug. Hawking¹⁰ gave toxic doses of sulfanilamide to rabbits and cats, and in those that recovered he found no histologic changes in the liver, kidneys or other viscera. Those animals which died from very large doses showed slight degenerative changes in the central nervous system in the form of chromatolysis in neurons of the anterior columns of the spinal cord, and in some of the nerve cells of the cortex and midbrain. In mice, Hageman¹¹ found some hemosiderin deposition in the spleen and slightly increased eosinophilia in the bone marrow.

Sulfanilamide could not be blamed as the cause of death in the patients who died after taking Elixir of Sulfanilamide. Necropsies and animal experiments showed that the cause was the diethylene glycol used as a vehicle. In the control studies on this problem done by Cannon,¹² two dogs and four rats were given sulfanilamide alone to see whether any tissue changes occurred. One dog and none of the rats experienced toxic manifestations. Autopsy revealed slight microscopic changes in the kidneys, consisting of moderate fatty degeneration in some of the collecting tubules of the dogs, but minimal in the rats. The livers of both dogs and rats showed no hydropic degeneration and practically no fatty changes. Sufficient observations on the organs of patients dying after sulfanilamide had been administered have not appeared. Although many of the clinical results reported following sulfanilamide treatment have been striking, its effect on body tissues in terms of late pathologic changes caused by this drug remains for the future to disclose.

CLINICAL USE

At present the clinical use of sulfanilamide is necessarily almost wholly empirical because the site and exact mode of action are not known. In the human subject, by any route of administration, the drug is readily absorbed and quickly diffused through the tissues. In this respect it is

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Scarlet Fever Results in the treatment of scarlatina have not been so striking. In the few reports available most cases have recovered, but the institution of sulfanilamide therapy during the acute stage of the illness did not appreciably accelerate the rate of recovery.²⁰ In a series of 150 cases reported by Peters and Havard,²¹ proseptasine—an English preparation, para-benzylaminobenzenesulfonamide—decreased the number of complications by about 20 per cent, but the patients treated had fever twelve hours longer than did the patients used as controls. The complications that may develop after scarlatina, such as otitis media, erysipelas and signs of renal damage, may respond favorably

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MENINGOCOCCAL INFECTIONS

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a polyvalent serum may not contain the specific antibodies against the particular strain infecting a given patient. In a further comparison, Brown²⁸ has demonstrated that the protective influence of 8 mg of para-aminobenzenesulfonamide is comparable to 0.1 cc. of highly potent antimeningococcal serum. Serum may be used alternately with sulfanilamide given intraspinally.

In the meningococcemia associated with meningitis, sulfanilamide by mouth is effective in rapidly clearing the blood stream of organisms. Very few reports of meningococcemia without meningitis treated with sulfanilamide have been made to date.

GNORRHOEAL INFECTIONS

As was to be expected because of the close biologic relation of the gonococcus to the meningococcus, sulfanilamide was applied to the treatment of gonorrhea after beneficial results had been obtained in meningococcal infections. The first reports were extremely favorable, but as data accumulate more and more failures occur. Ninety per cent cures have been reported by Reuter,²⁹ and the Mayo Clinic³⁰ gives 90 per cent for male and 80 per cent for female patients. Instead of simply dividing the cases into acute and chronic, Herold²⁹ paid particular attention to first infections and found that the patients respond poorly if at all. All so-called cures in his series were in patients who had had gonorrhea for some time. In a more recent report³⁰ of 72 cases treated and adequately followed, there were 12 complete failures and only 14 cures.

Sulfanilamide may cause the organisms to disappear from the stained smears in from two to six days. However, this may give a false sense of security to both patient and physician as to adequate treatment and cure. It is apparently effective in some cases in preventing an extension of the infection to the posterior urethra and prostate.

In the chronic cases, in which the drug seems to be the most effective, Dees and Colston³¹ originally outlined the oral dose as follows: 4.8 gm daily for two days, 3.6 gm for three days, and 2.4 gm for from four to eight days. More recently Walther³² has considered this dosage too large, and has advised beginning with smaller doses and gradually increasing the amount for example, 1.2 gm for two days, 2.4 gm for two days and an increase to 4.8 gm daily as tolerated. It is unwise to attempt the treatment of gonorrhea by the injection of sulfanilamide into the urethra.

The results in the treatment of gonococcal arthritis have been too few to warrant definite conclusions. Keefer³³ has found it possible to sterilize the synovial fluid within two days after the oral

body weight may be necessary, and seems to be well tolerated. Several tablets are to be given at intervals of from four to six hours. In critical illness, such as streptococcal septicemia or meningitis, from 4 to 5 gm. may be given in the first four or six hours in order to obtain the desired blood level. The dose may then be reduced daily as the fever subsides and the patient improves. Owing to the tendency of streptococcal infections to recur, the drug usually must be given until the patient is well on the way to recovery.

A second method of administration used where the patient is not critically ill, as in urinary infections, is to begin with smaller doses, as 2.0 gm (30 gr) the first day, 2.5 gm the second, and so forth, increasing the dose until the desired blood level has been obtained.

In patients with nausea, vomiting or coma, in whom administration by mouth is impractical, parenteral routes may be used.

Parenteral Administration For parenteral administration, two substances are available, the red prontosil (disodium salt) solution for intramuscular use, and the white crystalline sulfanilamide powder, within its limits of solubility, for subcutaneous or intrathecal injection. The tablet for oral use cannot be dissolved for parenteral administration.

Although used rather extensively when the drug was first placed on the market, the red prontosil solution for intramuscular injection has become less popular than formerly. When given, it is used in patients weighing less than 150 lb on the basis of 1 cc. per pound of body weight as the total daily dose, to be given at six-hour intervals. In individuals weighing more, the dose is 0.75 cc per pound of body weight. Prontosil in this form colors the skin and the urine from pink to red. It has been found inadvisable in intraspinal therapy.¹⁷ Prontosil is thought to be decomposed in the body with the formation of para-aminobenzenesulfonamide.

The sulfanilamide powder is soluble up to 0.8 per cent in physiologic saline, and is used in this form for subcutaneous and intrathecal injections. It is best to prepare the solution each day, even though it is fairly stable when kept at room temperature, because if it is placed on ice, the sulfanilamide rapidly crystallizes out of solution. To prepare such a solution, bring 100 cc. of sterile physiologic saline to a boil, add 0.8 gm. of the white crystalline powder and dissolve by the aid of shaking, inject when the solution has cooled to 37°C. The dose for hypodermoclysis is as follows: for individuals weighing up to 40 lb, 100 cc., from 40 to 80 lb, 200 cc., from 80 to 120 lb, 300 cc., and over 120 lb, 400 cc. A satisfactory initial dose for

adults is from 400 to 700 cc. The dose for intraspinal injection is from 15 to 30 cc. at from six- to eight-hour intervals. Slightly more cerebrospinal fluid than the quantity of sulfanilamide solution to be injected having been removed, the latter should be administered by gravity method, never under pressure. This solution has also been advocated for rectal administration, the amount of the dose, however, cannot be accurately given, as the rate of absorption of sulfanilamide from the colon and rectum is unknown.

The red prontosil or the sulfanilamide saline solution should never be given intravenously, since the excretion of the drug by the kidneys is so rapid that an adequate level of concentration in the blood is difficult to maintain. This method of administration is unnecessary, as the oral or subcutaneous routes are very effective in clearing the blood stream of susceptible organisms. Furthermore, untoward reactions are common when the drug is given by vein.

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that it is the drug of choice in the average case, and that it is usually easier to get a urine slightly alkaline for sulfanilamide action than to obtain a pH of 5.5 necessary for mandelic acid. Thus, with one drug acting only in an acid medium and the other giving the best results in an alkaline medium, the two supplement each other, and should be used in the treatment of urinary infections according to the organisms causing them.

OTHER ORGANISMS AND INFECTIONS

The widespread enthusiasm over sulfanilamide and its therapeutic possibilities has caused it to be tried in almost every type of infection, even far removed from those due to the streptococcus. Many of the studies have been confined to the test tube, where the effect of this drug has been tried on *Bacillus typhosus*, *B. paratyphosus A* and *B*, *B. dysenteriae* (Flexner, Shiga) and related gram-negative bacilli,⁴⁵ and *Hemophilus influenzae*⁴⁶ without any action.

In animal experiments with mice, Buttle and his associates⁴⁷ found sulfanilamide to give some protection against *B. typhosus*, *B. paratyphosus B*, *B. aertrycke*, Friedländer's bacillus, *Pasteurella pseudotuberculosis* and *P. septicus*. In the same animal it is ineffective against the viruses of encephalitis (St. Louis type) and of benign lymphocytic choriomeningitis.⁴⁸ Protosil was effective in rabbits in infections caused by the latter but ineffective in herpes-virus infection and also in that due to the virus of lymphogranuloma inguinale in monkeys.⁴⁹ In the rabbit, sulfanilamide had no effect on *Treponema pallidum*.⁴⁹

In human patients, sulfanilamide has been found to be relatively ineffective in staphylococcal infections (except in the urine), *Streptococcus viridans* endocarditis, rheumatic fever and chorea. Massell⁵⁰ found a failure of the drug to prevent the recurrence of rheumatic fever after streptococcal sore throat treated with sulfanilamide. In the treatment of gas gangrene due to *B. welchii* the drug has met with some degree of success.⁵¹ In a few cases it has been reported as effective in the treatment of malaria, both acquired⁵² and induced.⁵³

In mixed infections, such as those due to streptococci and staphylococci, the drug may be of benefit. Equivocal results have been reported in the treatment of streptococcal infections complicating tuberculosis.⁵⁴ Isolated instances have occurred in which the condition of patients with tuberculosis has been made definitely worse by sulfanilamide.

TOXIC EFFECTS

Untoward reactions, even death, may result from the administration of sulfanilamide, a fact which

in several communities has prompted legislation regarding the sale and use of this drug.⁵⁵ The toxic effects are more commonly the result of its indiscriminate use, but may occur from an idiosyncrasy to it. They may be classed as of three types: mild, moderate and severe. The mild symptoms consist of headache, anorexia, vertigo and general malaise, with possible slight cyanosis and dyspnea. The moderate reactions may be classed as a progression of any of the foregoing symptoms, with special reference to cyanosis and dyspnea. The severe reactions may result in persistent sulfhemoglobinemia, skin manifestations, hyperpyrexia or hypopyrexia, abdominal and chest pains, tachycardia, persistent dyspnea, diarrhea and numbness and tingling of the hands and feet. Marked disturbances of the blood, such as anemia, jaundice, leukopenia and agranulocytosis, may occur. The severe manifestations may result in collapse and death.

A lowering of the blood-plasma carbon-dioxide-combining power commonly occurs following the administration of sulfanilamide.⁵⁶

Buchtel and Cook⁴² have found that 15 per cent of patients cannot take large doses of sulfanilamide, and 10 per cent are unable to tolerate it at all. Patients in bed tolerate larger doses than do those who are ambulatory. Several investigators have pointed out that ambulatory patients exposed to sunlight are more apt than are others to develop a skin rash after sulfanilamide. In general, children tolerate the drug better than do adults. Elderly patients with cardiac, renal or hepatic involvement cannot stand the larger doses as can others.

The commonest symptoms of sulfanilamide toxicity are cyanosis and dyspnea. Cyanosis occurs in about 75 per cent of patients receiving the drug, and may appear early. It is thought to be due to methemoglobin or sulfhemoglobin formation, or to a peculiar red-cell-binding pigment in the blood.⁵⁷ In the former case it is usually transient in character and does not have lasting effects. It can be determined spectroscopically, yielding a band at a wave length of 562 m μ . Sulfhemoglobinemia, on the other hand, as demonstrated by Colebrook and Kenny,¹⁹ Discombe,⁵⁸ and Paton and Eaton,⁵⁹ is of a more lasting character and may be responsible for many symptoms and pathologic changes. It yields a band in the absorption spectrum at 620 m μ . Naturally, sulfhemoglobinemia can reduce the oxygen capacity of the blood, but it need not affect the hemoglobin content as determined by routine colorimetric methods.

According to the more recent studies of Archer and Discombe,⁶⁰ any preparations which are liable to produce a watery stool in the patient, such as magnesium sulfate and other cathartics, may ag-

administration of sulfanilamide. He considers this evidence that sulfanilamide may be effective in the treatment of gonococcal arthritis, particularly in patients with an infected synovial fluid. Keefer's studies³⁴ have shown further that after several days' treatment the blood becomes bactericidal as well as bacteriostatic. That the drug does not hinder natural immunologic processes is suggested by the failure of sulfanilamide to influence the gonococcal complement-fixation reaction of the blood.

PNEUMOCOCCAL INFECTIONS

Domagk's original report stated that prontosil was ineffective against pneumococci, and Horel's³⁵ later communication revealed equivocal results. In experimental pneumococcal infections in animals, rats, mice and rabbits have varied in their responses to sulfanilamide, with conflicting conclusions resulting. Pneumococcal pneumonia in the rat approximates most closely that seen in the human subject, and in experiments with this test animal the drug has been effective in combating Types I, II, III and XIV. In patients, however, the results have not been striking. Most conservative clinicians have been satisfied to treat Types I and II with serum. As a result, no adequate series of cases treated with sulfanilamide has appeared. With serum not yet available, Heintzelman, Hadley and Mellon³⁶ have shown good results in the treatment of the highly fatal Type III with sulfanilamide. In their series of 19 cases, of which 9 were treated and 10 were controls, 7 treated patients recovered, a mortality of 22 per cent. With 23 cases in their community added to the untreated cases, 9 patients recovered, a mortality of 73 per cent. Many more data are essential, however, before sulfanilamide can be accepted as an effective therapeutic agent in the treatment of pneumococcal pneumonia.

In other infections due to pneumococcus, such as otitis media and mastoiditis, sulfanilamide may be of benefit.³⁷ A temporary improvement in patients with pneumococcal meningitis with a reduction in the organisms and cells in the cerebrospinal fluid has been noted, but no recoveries following sulfanilamide therapy have been reported.

URINARY TRACT INFECTIONS

Sulfanilamide has proved of distinct value in the treatment of certain infections of the urinary tract. Marshall, Emerson and Cutting³⁸ compared the renal clearance of sulfanilamide with a simultaneously obtained creatinine clearance, and found the former from 20 to 30 per cent of the latter. Their studies indicate that the drug is excreted entirely by glomerular filtration and that from 70

to 80 per cent of it is reabsorbed by the tubules. The concentration in which it is excreted depends upon the amount administered and upon the function of the kidneys.

Helmholz and his co-workers^{39 40 41 42 43} at the Mayo Clinic have made extensive studies with sulfanilamide in the treatment of urinary sepsis. In the human subject, sulfanilamide is excreted in the urine chiefly in two forms, in the free state and as para-acetylamino benzenesulfonamide. The experiments of Helmholz and Osterberg⁴³ indicate that concentrations of free sulfanilamide of from 30 to 40 mg per 100 cc of urine are necessary in order to obtain good bactericidal action, but occasionally even at lower concentrations there is a bacteriostatic effect. From 3 to 4 gm of sulfanilamide a day gives a urinary excretion of from 60 to 125 mg of free sulfanilamide and from 50 to 100 mg conjugated as the para-acetyl salt. In the case of impaired kidney function the drug is excreted in the urine in lower concentrations, so that it is retained in the blood stream to give a higher blood level, which may result in toxic manifestations. However, when used cautiously (Helmholz and Osterberg) a lower urinary concentration of the drug has been found effective in treating infection of the urinary tract in spite of an elevated blood urea nitrogen.

Sulfanilamide given by mouth has been found effective in the treatment of urinary sepsis due to *Staphylococcus aureus*, *Bacillus coli* and *Aerobacter aerogenes*, and in some cases due to *Proteus vulgaris* and to *Pseudomonas seruginosa*. In infections due to *Streptococcus fecalis* the drug is ineffective. In general, bacillary infections respond more favorably than do those due to cocci.

Sulfanilamide is usually more effective in an alkaline than in an acid urine. Consequently, it may be advisable to administer from 0.3 to 0.6 gm (5 to 10 gr) of sodium bicarbonate with each dose. In order to act in an acid urine the concentration of sulfanilamide must be higher than in the case of an alkaline urine.

An effective dose by mouth, as outlined by Helmholz, consists, in adults, in 2.0 gm the first day, 2.6 gm the second day, 4.0 gm the third day and so on, with a gradual decrease as the desired blood and urinary concentrations are obtained and good clinical results are observed. In general, patients taking larger doses show a more satisfactory response. The daily dose for infants is from 0.3 to 0.6 gm, and for children of twelve, 2.0 gm.

In comparing sulfanilamide with the recently introduced mandelic acid in the treatment of urinary tract infections, Helmholz⁴⁴ points out that each has its place. The advantages of sulfanilamide are that it can be used in acute infections,

long-continued administration have yet to be disclosed

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gravate the deleterious effects of sulfanilamide in causing sulfhemoglobinemia. Hydrochloric acid and coal-tar derivatives may act similarly. Sulfhemoglobinemia, however, may develop from sulfanilamide therapy alone. Patients may develop both methemoglobinemia and sulfhemoglobinemia, but not usually at the same time.

The blood should be examined frequently for the possible development of anemia. A lowering of the hemoglobin and red-cell content of the peripheral blood occurs rather commonly after sulfanilamide administration. Severe anemias, as reported by Harvey and Janeway,⁶¹ may result, and may be hemolytic or aplastic in character. These authors compared the anemia which they observed with the hemolytic crises produced by phenylhydrazine. It is of interest that in the cases of anemia reported by them, and similarly in those reported by Kohn,⁶² as the anemia developed the white-cell count rose, with many immature forms present. In the necropsy study by Borst,⁶³ in which the patient died with agranulocytosis, study of the bone marrow was inconclusive.

That drugs possessing in common a benzene ring with an attached NH_2 or amine group, which increases the ease of oxidation, may cause agranulocytosis in susceptible individuals was suggested by Kracke.⁶⁴ This may be significant in regard to sulfanilamide, since it is such a benzene-ring compound, and since instances of agranulocytosis following its use have occurred. Serial leukocyte counts in patients receiving the drug may show either an increase or a decrease in white blood cells. In Borst's case of agranulocytosis the patient had had a previous blood disorder, which may have been a factor. Frequent white-blood-cell counts in the case reported by Young⁶⁵ gave no warning of the impending disaster.

When hyperpyrexia occurs as a toxic manifestation of sulfanilamide therapy, it may be difficult to tell whether it is due to the drug or to the infection for which it is being given. As described by Hageman and Blake,⁶⁶ it is usually abrupt in onset and may occur at any time. In their series it occurred in 21 of 134 cases, an incidence of 16 per cent. The reaction varies in intensity and the average duration is from two to four days, with prolongation in cases in which the drug is continued. Eosinophilia of from 1 to 6 per cent was present in about half their 21 cases. The condition may very closely simulate serum sickness, skin tests for sensitivity showed no positive reactions.

Skin rashes occurring after sulfanilamide are of various forms, simulating measles, scarlet fever, urticaria and erythema multiforme. They may resemble the reactions from the barbiturates.⁶⁷ The

eruption occurs most commonly on the face, trunk and extremities, and may or may not be accompanied by fever. In certain ambulatory cases reported there seems to have been a definite relation between the development of a rash and exposure to sunlight. Positive skin tests have occasionally been reported.

Although tissue reactions to any appreciable degree have not occurred in animal experiments with sulfanilamide, nephropathies in human subjects have been reported. Colebrook and Kenny¹⁹ state that 40 per cent of 38 patients studied showed red blood cells and casts in the urine, while 20 per cent had an increase in urinary albumin content over that originally present. Definite nephritis has been reported.⁶⁸ It may be difficult, however, to evaluate the relation of the nephropathy to the drug or to the infection, since Anghelscu et al.⁶⁹ and others have successfully treated cases of erysipelas with concurrent renal disease.

Treatment of Toxic Manifestations The treatment of toxic manifestations from sulfanilamide administration depends to some extent on the nature of the reaction. Methemoglobinemia is a common finding, and the cyanosis alone does not contraindicate the use of the drug, but it must be continued cautiously. With all other types of reaction administration of the drug should be stopped. Because sulfanilamide is so rapidly and practically completely excreted in the urine, fluids should be forced. Archer and Discombe⁶⁰ have outlined certain principles for the prevention of sulfhemoglobinemia. They advise the use of no other drugs with sulfanilamide, except for sodium bicarbonate, employed in order to obtain an alkaline urine or to combat acidosis. The colon should be kept free from food residues by a cleansing enema before treatment is started, and a low-residue diet of adequate caloric value but containing few eggs should be given. When sulfhemoglobinemia occurs, the only treatment is blood transfusion. This is also the treatment for severe anemia, as liver and iron are apparently not effective. The administration of oxygen may be helpful in cases of methemoglobinemia.

SUMMARY

Sulfanilamide appears to have proved its worth as an effective chemotherapeutic agent in the treatment of certain infections. From the more important facts here summarized it can be clearly seen that it is not a panacea. Since there is no shorter road to the discredit of any drug than its indiscriminate use, emphasis has been placed upon methods of administration, dosages and toxic effects. Clearer indications and contraindications to its use and the possible deleterious effects of its

volving the intima and the media. Nearby there was another slit in the aorta about 1 cm. in length. From the base of the aorta the wall was dissected down to the mouth of the celiac artery, where the dissection through the intima reruptured into the aorta. Below this point the aorta was intact. There was a small extravasation of blood into the posterior mediastinum. Scattered over the intima of the entire aorta there were small, raised, yellowish, atheromatous deposits.

Histologic examination of the myocardium revealed changes indicating acute infarction. The inner half of the myocardium of the left ventricle contained massive infiltration of the stroma by polymorphonuclear leukocytes. There was also occasional invasion of the muscle fibers, which showed hyalinization with karyolysis. Sections of the aorta revealed an essentially normal structure.

sinus rhythm with a rate of 79 per minute. The P R interval was 0.16 second. T₁ was upright, T₂ low, T₃ inverted. There was left ventricular preponderance. The diagnosis was essential hypertension, and there was serologic evidence of syphilis.

The patient was admitted to the hospital on August 9, 1937, in a state of circulatory collapse. She was unable to give an adequate history. On the day of admission she suddenly experienced a severe, sharp pain in the middle of the back of her thorax. Subsequently the pain was felt in the substernal and subxiphoid regions. Because of the severity of the pain she was barely able to breathe. On physical examination she was found to be anxious and pale, and covered with cold, beaded perspiration. The heart rate was rapid and regular. The sounds were barely audible. The blood pressure was 60/40. The temperature

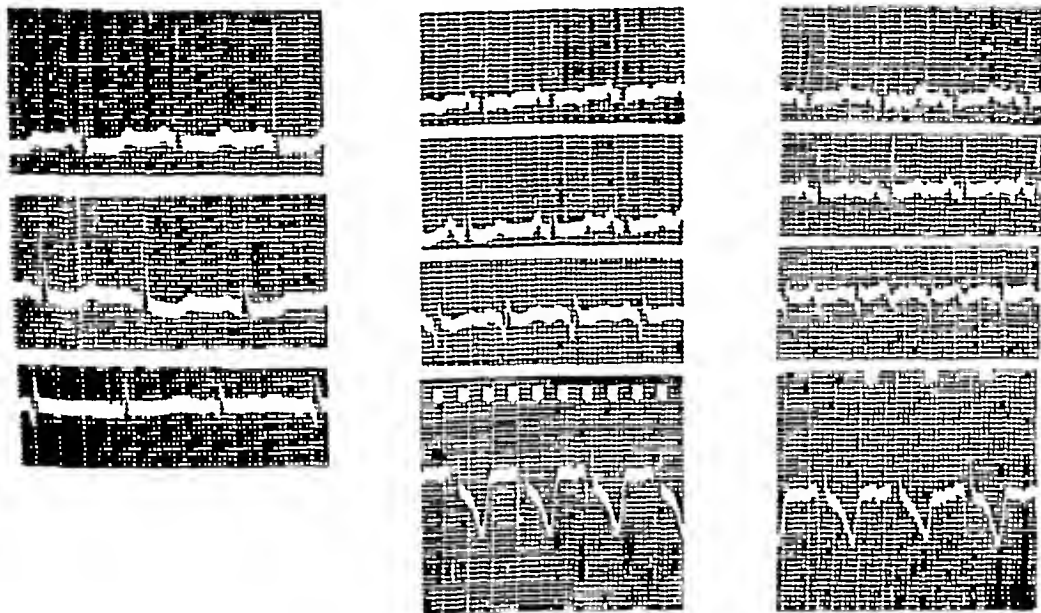


Figure 1 *Electrocardiograms in Case 1 before (12/8/36) and after (11/4/37 and 11/5/37) the onset of dissecting aneurysm, reproduced in respective order*

The anatomic diagnoses were as follows: dissecting aneurysm of the aorta with hemopericardium, pulmonary congestion and edema, compression of the mouth of the left coronary artery caused by dissection of this artery, myocardial infarction of the left ventricle, healed chronic pyelonephritis, moderate atherosclerosis of the aorta, and healed cholecystitis.

Case 2 A 61-year-old, white woman was observed in the Outpatient Department on several occasions between July 9 and July 22, 1937. Her main complaints were insomnia and dizziness of 3 years duration. She had known since 1925 that she had "high blood pressure." Her mother died of "high blood pressure" at the age of 55. One brother died from "lifting" at the age of 32. Her husband died insane.

Physical examination indicated a moderately enlarged heart with regular rhythm. There was an apical systolic murmur. The blood pressure on two occasions was 204/120 and 200/110. The rest of the examination was unessential. Blood Wassermann and Hinton tests were positive. An electrocardiogram on July 16, 1937, showed

was 99°F. The blood count showed 3,000,000 red cells, with a hemoglobin of 60% and 14,800 white cells. A blood Hinton test was positive. The electrocardiogram revealed normal sinus rhythm. T₁ and T₂ were upright, T₃ diphasic. The chest lead (chest electrode, fifth interspace 8 cm from midline, and left leg) was diphasic (abnormal), there was left ventricular preponderance (Fig 2). There were only minor changes since the electrocardiogram taken on July 16.

The day after admission the patient's condition was somewhat improved. The heart was found to be displaced to the right. Signs of fluid appeared in the left chest, and a tap yielded 50 cc. of bloody fluid. The patient failed to respond to oxygen and shock therapy and died on August 11. A diagnosis of luecic and arteriosclerotic heart disease with dissecting aneurysm was made.

The following were the pertinent findings at post-mortem examination. The left pleural cavity contained about 1500 cc. of clotted blood. The left half of the posterior mediastinum was swollen because of the pres-

DISSECTING ANEURYSM OF THE AORTA

Two Cases with Unusual Features

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RECENT definition of the clinical course of dissecting aneurysm of the aorta has resulted in its more frequent recognition. Whereas up to 1935 the condition was diagnosed in but some half-dozen instances, an appreciable number of cases have been correctly diagnosed during the past three years.^{1 2 3} Recognition of a case with a typical clinical course is no longer difficult. Indeed, the clinical picture may be specific. Cases with a "silent" or atypical course, on the other hand, usually escape recognition.

In the differential diagnosis, coronary thrombosis offers the main difficulty. The presence of syphilitic aortitis or aneurysm is considered by most writers² as evidence against the presence of dissecting aneurysm. The inflammatory reactions caused by syphilis tend to fuse the layers of the aorta, thereby making dissection difficult if not impossible. Syphilitic aneurysm usually becomes thinned out and ruptures without dissection.

The following 2 cases are reported because they demonstrate that dissecting aneurysm can cause coronary occlusion and myocardial infarction, and that syphilitic and dissecting aneurysm may co-exist.

CASE REPORTS

Case 1 A 40-year-old, male Filipino was first observed in December, 1936. For 7 years he had experienced mild epigastric distress. For 6 months he had noted subcardiac and more severe epigastric distress, and had dyspnea and palpitation on exertion. The discomfort appeared after eating, was nonradiating and was relieved by soda. The day before entering the hospital he vomited coffee ground material and on four occasions had tarry stools.

Physical examination revealed slight sclerosis of the vessels of the eyegrounds. The heart was slightly enlarged. The rhythm was regular. There was a soft systolic murmur. The aortic second sound was ringing. The arterial pressure varied from 168/106 to 178/120. The rest of the findings were unessential. The urine revealed no abnormalities. There was a severe degree of secondary anemia, with a red-blood-cell count of 2,400,000 and a hemoglobin of 34%. The white-blood-cell count was 13,800. The stools were tarry and the guaiac test was 4+. A blood Hinton test was negative. X ray study of the gastrointestinal canal revealed changes diagnosed as gastric and duodenal ulcers. The electrocardiogram revealed changes consistent with digitalis effect. The rest of the tests were unessential.

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Following the use of Sippy diet and administration of iron, the gastric symptoms and the anemia decreased. The diagnoses were peptic ulcers, essential hypertension and a slight degree of arteriosclerosis.

After leaving the hospital the patient continued to feel well. He lost his position, however, because "high blood pressure" was discovered on routine physical examination. At 1:30 a.m. on November 2, 1937, he experienced sudden breathlessness and orthopnea, which continued for several hours. In the afternoon of the same day he developed sharp, burning, boring, nonradiating pain in the epigastrium. When he entered the hospital 2 days later he was weak and irritable. The radial pulse was imperceptible and the arterial pressure could not be measured. In a few hours he improved somewhat.

Physical examination revealed an anxious patient with slight cyanosis. The heart was moderately enlarged. The pulse rate was from 130 to 140 and regular. The sounds were weak. The pulmonary second sound was accentuated and the aortic second sound was barely audible. The blood pressure was 100/55. The lungs were normal. There was tenderness in the epigastrium, but no spasm. The other findings were irrelevant. The red-blood-cell count was 6,000,000 and the hemoglobin 95%. The white blood cells on two occasions numbered 27,600 and 21,300. The nonprotein nitrogen of the blood was 46 mg per cent. The x ray picture of the chest showed widening of the aorta. The electrocardiogram taken on November 4 showed T₁ and T₂ diphasic, T₃ upright, T₄ (chest electrode, fifth interspace 6 cm. from midline, and left leg) inverted (normal), and left ventricular preponderance. There was sinusauricular tachycardia, with a pulse rate of 107. The electrocardiogram was interpreted as indicating myocardial disease. The next day, however, T₁, T₂ and T₃ were diphasic and T₄ was inverted. There was a prolonged Q-T interval, K equaled 0.47 (Fig 1). Because of changes in the T waves within 24 hours, an acute myocardial process, possibly coronary thrombosis, was considered likely, although the electrocardiographic changes were not characteristic of thrombosis. The rest of the laboratory findings were unessential. The general condition remained practically unaltered when, 2 days after admission, the patient suddenly collapsed, developed convulsions and died.

The differential diagnosis rested between coronary thrombosis and perforated gastric ulcer.

The essential findings at postmortem were as follows. The pericardial sac was distended and contained about 200 cc. of clotted blood. At the root of the pulmonary artery and the aorta there were extensive hemorrhagic extravasations into the adventitial tissue. The heart weighed 500 gm. The myocardium of the lateral aspect of the left ventricle was lighter than the normal portions and contained yellowish and reddish areas. About the mouths of both coronary arteries there was a marked degree of extravasation of blood. The left coronary artery was compressed near its opening by a dissection which extended to a distance of about 1 cm. from the orifice. The coronary arteries contained no thrombus.

About 1 cm. above the aortic valve there was a sharp, cleftlike rupture approximately 4 cm. in length, in

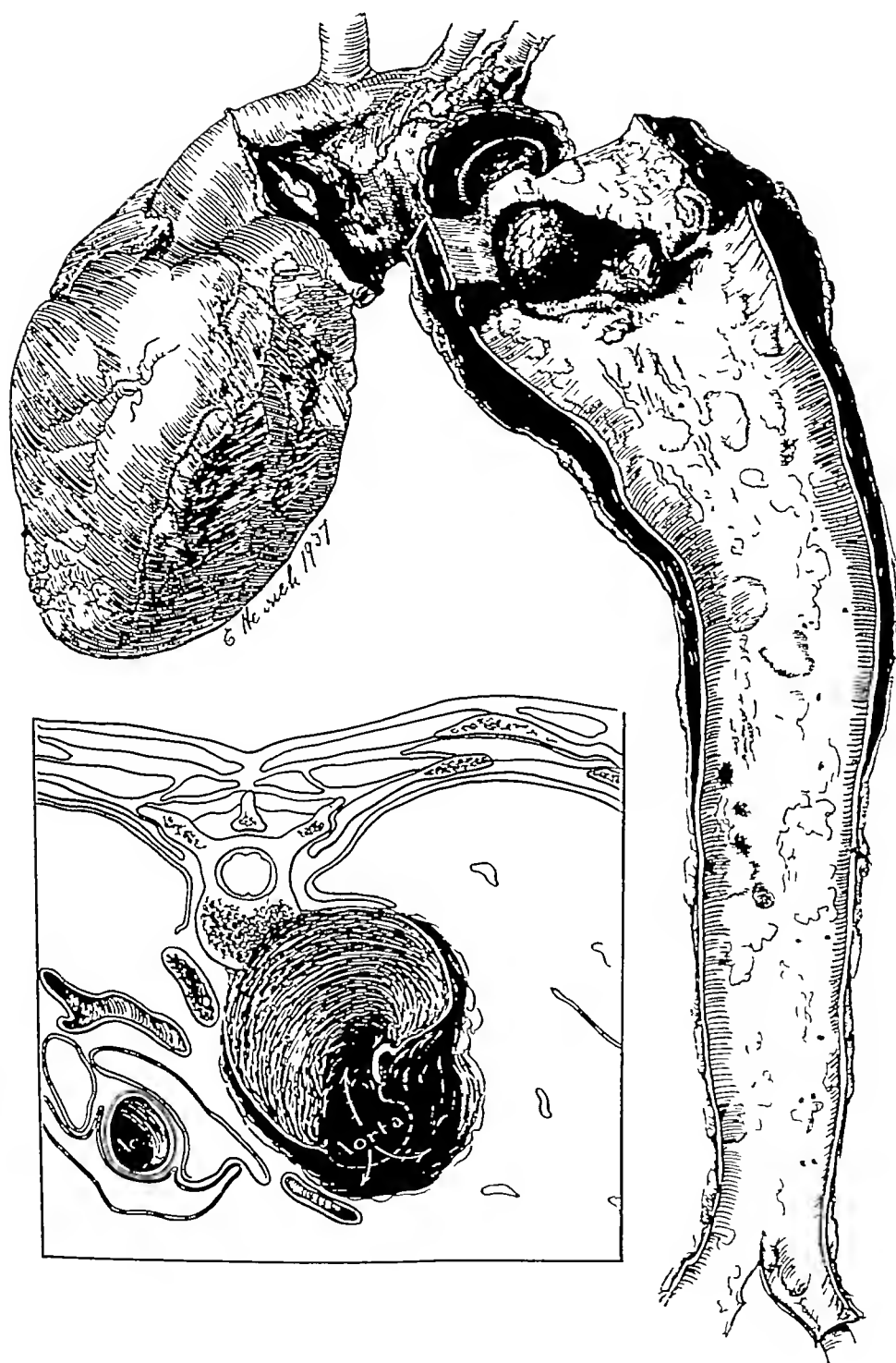


Figure 3 Appearance of the aorta and of the opening of the old syphilitic aneurysm: acute tear of the intima leading to the dissection toward the base of the heart and to the abdominal aorta (upper picture) Transverse section at the level of the third thoracic vertebra showing the relation of the acute dissection to the syphilitic aneurysm: note erosion of part of the vertebral body by the syphilitic aneurysm (lower picture)

ence of considerable dark blood. At the level of the ninth thoracic vertebra there was roughening of the parietal pleura, which appeared to be the site of entrance of blood into the left pleural cavity. The tissues of the superior mediastinum were infiltrated with blood.

The heart weighed 380 gm. The aortic cusps were slightly thickened, but there was no separation of the commissures or interadherence of the cusps. The mouths of the coronary arteries were patent, with slight narrowing of the right coronary orifice. The upper fifth of the upper lobe of the left lung was voluminous, gray and crepitant. The remainder of the left lung was collapsed.

The entire thoracic aorta was dilated. At the junction of the arch and the descending aorta there was a sacular

ly normal structure. There was some increased vascularity. Sections of the arch were also normal. Sections obtained from the old aneurysm showed endarteritis with thickening of the adventitia. There was also perivascular infiltration with lymphocytes. There were scars and absence of elastic tissue in the media. These changes were considered as being consistent with a syphilitic process. The site of the acute rupture revealed normal margins, except for evidence of hemorrhage and infiltration by polymorphonuclear leukocytes of the layers between the intima and media. Section of the abdominal aorta revealed marked thickening of the intima and vascularization of the media below the atheroma of the intima.

The anatomical diagnoses were acute dissecting aneurysm

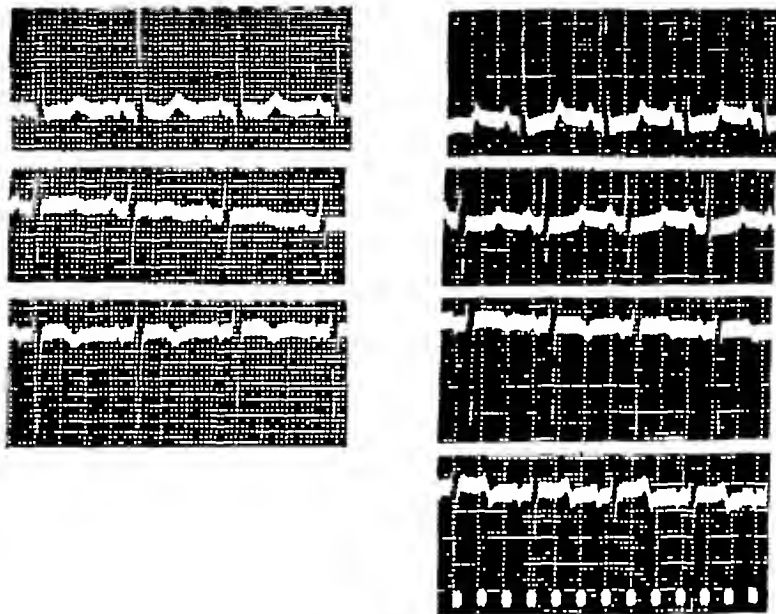


Figure 2 Electrocardiograms in Case 2 before (7/16/37) and after (8/10/37) the onset of dissecting aneurysm, reproduced in respective order

aneurysm, conical in shape and 6 cm in height, directed upward and posteriorly (Fig 3). The mouth of the aneurysm measured 5 cm in diameter, and its center was situated 8 cm from the origin of the left subclavian artery. The apex of the sac rested on the anterior aspects of the bodies of the second and third thoracic vertebrae, the latter of which was eroded to a depth of 1 cm. The aneurysm was almost completely filled with organized lamellated clots. The undilated part of the aorta at about the level of the center of the aneurysm was completely ruptured transversely. The margins of rupture were irregular. The mediastinal hematoma arose from this rupture. Beginning with the acute tear the aorta was dissected upward and downward between the media and adventitia. Downward the dissection ended at the level of the upper portion of the abdominal aorta. The intima of the aorta contained several atheromas from 0.1 to 1 cm in diameter. Some of these were calcified. At the junction of the old aneurysm and unruptured aortic wall along the margin of the rupture there was an area of softening 1.5 cm in diameter, which might have been the surface of the original rupture. The rest of the findings were irrelevant.

Histologic examination of the aorta revealed the following. Section of the ascending aorta showed essential-

ly normal structure. There was some increased vascularity. Sections of the arch were also normal. Sections obtained from the old aneurysm showed endarteritis with thickening of the adventitia. There was also perivascular infiltration with lymphocytes. There were scars and absence of elastic tissue in the media. These changes were considered as being consistent with a syphilitic process. The site of the acute rupture revealed normal margins, except for evidence of hemorrhage and infiltration by polymorphonuclear leukocytes of the layers between the intima and media. Section of the abdominal aorta revealed marked thickening of the intima and vascularization of the media below the atheroma of the intima.

DISCUSSION

A detailed description of the clinical course and of the functional and structural changes in dissecting aneurysm of the aorta has been given elsewhere.² As indicated, the condition should be considered as more than a medical "curiosity." The 10 cases previously reported occurred among 3206 necropsies, a ratio of about 1:320. Since this first report was published there have been, during the three years 1935 to 1937, inclusive, 11 additional cases among 2202 necropsies, a ratio of 1:200. It is of interest that in these 11 cases the condition was diagnosed 7 times clinically. The total number of correctly diagnosed cases available is about 15 since 1935, as contrasted with a total of 6 cases diagnosed up to that time.

of a larger group in the literature, failed to reveal such radiation without local dissection of the brachial artery.² Of 11 subsequent cases observed in the Boston City Hospital from 1935 to 1937, inclusive, there was only 1 in which radiation of pain occurred. This patient, a sixty-two-year-old man, had had attacks of precordial pain for two months prior to the onset of the dissecting aneurysm, which was characterized by aching pain in the chest, later radiating down both arms, into the penis and finally into both legs. The patient showed signs of vascular compression. The clinical diagnosis was dissecting aneurysm of the aorta with occlusion of the mesenteric, renal and iliac arteries. Postmortem examination confirmed the diagnosis of dissecting aneurysm. In addition, aortic stenosis caused by arteriosclerotic changes was found. It is possible that after the onset of dissection the presence of aortic stenosis interfered with the coronary flow, and that this was responsible for the character of the pain. Patients with aortic stenosis may have angina pectoris without coronary disease.

The features of Case 2 are even more unusual, and are of greater significance. The simultaneous occurrence of syphilitic and dissecting aneurysms seems to shatter the clinical axiom that syphilitic aneurysm speaks against the presence of dissecting aneurysm. The facts, however, that histologic examination revealed that the syphilis of the aorta was localized over the area involved by the old aneurysm, and that, contrariwise, syphilis was not present over the area of acute rupture, indicate that we are dealing with a rare case in which the two conditions coexisted. Hence, as in other cases, the acute rupture depended on arterial hypertension and on arteriosclerotic degeneration. Indeed, that the syphilitic inflammation induced a special resistance against the dissection is well demonstrated by the following facts: the dissection did not appreciably invade the old syphilitic aneurysmal wall, whereas it completely dissected the surrounding nonsyphilitic portion of the aorta, and in spite of the thinness of the old syphilitic aneurysm the dissecting aneurysm did not rupture over this area. This case therefore constitutes important direct evidence confirming our belief that the presence of syphilitic aortitis makes dissection difficult. Among the 300 cases of dissecting aneurysm analyzed by Shennan,¹ mainly collected from the literature, there were several in which the presence of syphilis was mentioned. The evidence for syphilis in

these cases, however, as is also stressed by Shennan, is insufficient. None of these cases had features similar to those of Case 2.

SUMMARY

1 Two cases of dissecting aneurysm of the aorta with unusual features are described, and reference is made to other cases which have been studied. In the first case, with electrocardiographic changes the dissection invaded the root of the aorta as well as the first portion of the left coronary artery, compressing the lumen of the mouth of this artery. This ischemia resulted in acute myocardial infarction. In the second case the patient suffered from arterial hypertension and from syphilis, and an old syphilitic aneurysm of the arch of the aorta coexisted with acute dissecting aneurysm originating near the opening of the syphilitic aneurysm. Histologic examination indicated that the syphilitic involvement was localized over the chronic aneurysm, while the area involved by the acute rupture contained an atheromatous softening without syphilitic changes. It is concluded that the two conditions occurred independently. The fact that the dissection invaded the syphilitic aneurysm but slightly, whereas it completely ripped the surrounding nonsyphilitic wall of the aorta, confirms the belief that a syphilitic process, through fusion of the layers of the aorta, tends to prevent dissection.

2 Among 2202 necropsies in the Boston City Hospital from 1935 to 1937, inclusive, dissecting aneurysm occurred in 11 instances, a ratio of 1/200. The condition was correctly diagnosed clinically in 7 of the 11 cases. Whereas but 6 cases had been recognized clinically up to 1935, the total number of correctly diagnosed cases now available from the literature is at least 21.

3 The differential diagnostic features of dissecting aneurysm and coronary thrombosis are discussed. Electrocardiographic changes may occur in dissecting aneurysm as a result of ischemia of the heart, due to acute blood loss, shock and pericardial tamponade, or, rarely, as a result of compression of the coronary artery.

REFERENCES

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The onset of dissecting aneurysm is characterized by sudden thoracic pain, transient syncope, dyspnea, orthopnea and prostration with circulatory collapse. Depending on the direction and the extension of the dissection, examination may reveal manifestations of mediastinal compression and tumor, partial or complete occlusion of arterial vessels and functional disturbances resulting from occlusion of the nutrient arteries, such as hemiplegia, paraplegia, monoplegia, intestinal paresis and infarction, hematuria and, at times, anuria. Tenderness and widening of the abdominal aorta may occur. As a result of rupture of the dissection, signs of fluid may develop over the chest, particularly over the left pleural surface, or the syndrome of cardiac tamponade may appear. Distortion of the aortic cusps may be the cause of diastolic murmur over this area in about 20 per cent of instances. In one case without pulmonary infarction jaundice developed, presumably as the result of hematoma.

Following the initial tear, thoracic pain often travels downward, and subsequently abdominal pain may develop. Frequently the signs of arterial compression change during the course of the disease. Fever and hemoptysis are often present after the onset of the rupture. In contrast to these manifestations, there are rare instances in which the onset is silent and the dissection is compatible with relatively good functional capacity. Development of an endothelial layer over the dissected surfaces of the aorta sometimes results in a true functioning double aorta.¹

It is obvious that the clinical course of dissecting aneurysm may closely resemble, and at times may be identical with, that of coronary thrombosis. The following are the main differences:

1. Whereas the onset of pain in dissecting aneurysm is usually sudden, the development of pain in coronary thrombosis is usually gradual and is often preceded by angina pectoris. In a smaller group thrombosis is preceded by attacks of pain of longer duration. The location of the pain of dissecting aneurysm is usually low substernal or in the mid-thoracic back. The pain does not radiate into the arm, except in rare instances, but is apt subsequently to travel, with the dissection, downward into the abdomen. The pain of coronary thrombosis, on the other hand, is not always mid-pain and usually radiates to the shoulders, arms, hands and other distant areas.

2. The chief characteristic features of the clinical course of dissecting aneurysm are compression of arterial and venous vessels, secondary manifestations of ischemia and hematoma of the aorta. These symptoms and signs often change from time to time. The vascular signs are apt eventually to

become more extensive, but in rare instances they clear up as a result of rerupture of the dissection into the main aortic channel, causing partial or complete re-establishment of the circulation.

3. Maintenance of high blood pressure occurs more frequently in dissecting aneurysm than in coronary thrombosis.

4. Aortic diastolic murmurs develop in dissecting aneurysm, but not in coronary thrombosis.

5. Pericardial friction rub is common in coronary thrombosis but relatively rare in dissecting aneurysm. In the latter condition the friction rub usually indicates beginning rupture of the dissection into the pericardial cavity, and therefore it is heard shortly before the onset of pericardial tamponade and death. Hence pericardial friction rub with relatively good peripheral circulation is distinctly in favor of coronary thrombosis.

6. Electrocardiographic changes with characteristic features of anterior or posterior infarction favor the diagnosis of coronary thrombosis.

7. Whereas the majority of patients survive attacks of coronary thrombosis, patients usually succumb to dissecting aneurysm of the aorta.

It is particularly fortunate that in both cases here reported electrocardiograms were obtained before as well as after the onset of the dissection. Until recently, few such observations were available on cases of dissecting aneurysm, and it has been generally held that the electrocardiogram is usually normal. Recently, Glendy and his associates² reported a case with electrocardiographic changes in Leads 2 and 3, which were suggestive of cardiac infarction of the posterior or diaphragmatic type. Postmortem examination in this case did not reveal myocardial infarction. The aortic dissection was found to extend proximally to the opening of the right coronary artery. Among the 11 cases observed in the past three years, electrocardiographic changes have been noted in at least 3 cases, in addition to those reported here. In these the dissection extended eventually into the pericardial cavity. The electrocardiographic changes are explained on the basis of cardiac anoxia, secondary to cardiac tamponade, to shock and to acute hemorrhage. The possibility of a certain degree of compression of the coronary arteries during life cannot be ruled out in these cases. The findings in Case 1 above indicate, however, that compression of the coronary artery as a secondary complication of dissecting aneurysm can in rare instances cause myocardial infarction. Hence electrocardiographic changes and coronary occlusion may be part of the picture.

It has been stated elsewhere that radiation of pain into the arm is rare in dissecting aneurysm. An analysis of 10 cases previously reported, as well as

is not definitely or exclusively an insurance risk, but had to be forced into this position by insurance. They admit that sickness insurance establishes a bureaucratic, organized, wholesale business in human misery, with central control and many branch establishments. They assert that social insurance is built on compulsion and on compensation against hazards, but compulsion leads to distrust, and regulation of risks leads to greed. Compulsion was necessary because only in this way was it possible to include broad sections of the population which were presumed to be in need of medical care but would not enter the system unless compelled to do so.

They have observed that sickness insurance has constantly restricted the direct relations between patients and physicians in private practice. Formerly there was a human relation which depended on confidence in the physician. Between the patient and his physician there is now a third party—the insurance carrier—and a fourth party,—the government,—a supervising bureaucracy which compels the physician to follow its regulations. Furthermore, these observers assert that if treatment does not bring the expected result the physician is discredited and is made punishable for every unavoidable failure.

Reports from countries having state-managed medicine state that the insured have not been satisfied with the new system. Restrictions of the means of healing have been offensive to them, they have looked on the contributions to the sickness-insurance system, taken from them through their employers by compulsion, as a retained share of their wages. They knew that they could obtain this retained money only in the form of insurance medical service or cash benefits, they believed they had been compelled to pay out money without receiving an equivalent, the only way in which the money or an equivalent could be recovered was to declare themselves sick and to meet the conditions set down by the law, this was an easy matter.

The reports continue with a criticism of the action of political parties which are using sickness insurance as the first step in the governmentalizing of all health care for the entire population. This point has not been reached, but it appears to be the objective.

Even in Europe some physicians have expressed the view that the idea of a free medical profession must not be abandoned, once it is completely abolished a cultural value will have been lost that cannot be replaced or restored. To physicians, human values are of greater importance than are political expedients.

These are only a few of the characteristics of systems of state managed medicine. All such systems

are not subject to the same criticisms, and those in some countries have been greatly improved since their inception by the continuous efforts of the medical profession of those countries.

Even at its best, do the American people and the American physicians want such a system? Before we wholly destroy our present plan of medical practice through revolutionary legislation, let us inquire carefully into the value of what we have and study searchingly the proposals of those who would take it from us, lest worse come in its place.

If there is truly any lack of good medical service for those who require it, the medical profession stands ready now, as it has invariably stood in the past, to supply that service. What other profession has ever developed such a tradition of sacrifice for the public welfare? It has been said that the rich and the poor get the best of medical care, and that the members of the great middle class suffer because they are unable to pay the costs of modern medical service.

The proponents and agitators for some radical change in the method of distributing medical services have made some serious and startling charges concerning the methods now in use. They continue to assert that 50 per cent of the population receives no medical care. A survey of some 38,600 persons made by the Committee on the Costs of Medical Care showed that 47.1 per cent had no illness over a period of more than a year. The study also showed that 47.9 per cent of these persons had the services of physicians. Only 5 per cent of the persons involved in the survey were presumably in need of medical services but for some reason did not avail themselves of medical care. Perhaps 5 per cent is not too large an estimate of those who because of human characteristics manifested as ignorance, stupidity or prejudice prefer cultism, patent medicines, the advice of friends or relatives or no medical service at all.

The medical profession today is conducting more social experiments in the methods of distributing medical services than all of the proponents for change have ever conducted. Out of the two hundred or more projects that are being studied or operated by county or state medical societies, it is hoped that methods may be found that can be utilized to supplement existing medical facilities wherever necessity demands.

These proponents and agitators have charged that the medical profession is static and obstructive. But without any compulsion from political or governmental sources, the profession has sought constantly to advance the standards of medical education, medical licensure and hospital practice, and is now making notable progress in the certifica-

A CHALLENGE TO MEDICINE

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CHICAGO

RECENT social changes have been more numerous and radical than at any time in history. Among these developments are many new forms of medical practice which are a striking departure from the time-tested private practice of medicine. On many sides there appear reformers who urge even more drastic changes in the methods of distributing medical care, based on the pattern of foreign systems of sickness insurance. Thus far the medical profession in the United States has averted the entanglements, political domination and inevitable deterioration of medical service that would come from a system of compulsory sickness insurance.

The persistent propaganda of the proponents of socialized medical service has caused many physicians to doubt the future of medicine. A few are even exhibiting a fatalistic attitude in declaring that the socialization of medicine is inevitable.

Unfortunately, not many of those who write or speak in favor of socialized medicine clearly define the term. What is meant by it? Certainly not public health, for that phase of medicine has long been supported by taxation; certainly not the medical care of the indigent, for that is held to be a responsibility of local communities, to be paid for from tax funds, certainly not the institutional care of the mentally sick, the epileptic and the feeble-minded, for present methods appear to be the most appropriate for persons thus afflicted; certainly not the sanatorium management of tuberculosis, for this method has contributed much to the control of that disease; certainly not the medical practice actually required in the clinical phase of medical education, for this is a necessity in the training of physicians; certainly not workmen's compensation, for that system is now provided by statute and is state-supervised to varying degrees. The socialization of medicine, as the term is commonly used, refers to any form of medical advice, diagnosis and treatment provided, conducted, controlled or subsidized by the Federal or any state government, with the exceptions stated.

There are many views as to the type and extent of the social change proposed. There are those who advocate that all medical care should be provided through taxation; that is, physicians should

be state employees. Others urge some form of sickness insurance—voluntary or compulsory.

Voluntary sickness-insurance systems are usually the precursors of compulsory systems. No country has ever operated a system of complete state medicine in which all medical services were financed by physicians who derived their sole income from the state, but many countries have adopted some system of sickness insurance. All these systems may be included in the term "state-managed medicine." No value can be derived from criticism of a country for having adopted a system of state-managed medicine, but a critical analysis of the systems themselves may be helpful in determining whether such methods are preferable to the free and independent practice of medicine such as exists in the United States.

A careful examination of the systems of state-managed medicine reveals the following conditions:

1. There is no decrease in the cost of medical care. Indeed, the system costs a staggering cost of maintenance.
2. Public health and preventive medicine are neglected or abandoned. State-managed medicine does not provide the annual health examinations or the immunizations usually provided before the system was adopted.
3. Morbidity and mortality are not reduced.
4. The problem of so-called chronic diseases is aggravated.
5. Neuroses are created.
6. Overmedication is encouraged.
7. The burden of the system is distributed over the whole income class, which is least able to bear it.
8. Medical care for the indigent is curtailed.
9. The medical profession is divided into a "first" and a "second" class.
10. Graduate education is not encouraged and is usually neglected.
11. The hospital load is increased. Hospitals are encouraged to practice medicine.
12. Attention and financing are concentrated on the less essential health and medical measures.
13. Diagnosis and treatment are mechanical and superficial.
14. Professional associations are compelled to devote their energies to the defense of medicine against non-medical and political interference rather than to scientific and educational services.
15. Medical service becomes a political issue.
16. Control over medical service is placed in the hands of unqualified, non-medical authorities and organized as such.
17. The road is closed to the use of more efficient methods.

Some European medical observers are now politer than formerly in criticizing their systems of state-managed medicine. They are seeing that sickness

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is not definitely or exclusively an insurance risk, but had to be forced into this position by insurance. They admit that sickness insurance establishes a bureaucratic, organized, wholesale business in human misery, with central control and many branch establishments. They assert that social insurance is built on compulsion and on compensation against hazards, but compulsion leads to distrust, and regulation of risks leads to greed. Compulsion was necessary because only in this way was it possible to include broad sections of the population which were presumed to be in need of medical care but would not enter the system unless compelled to do so.

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Reports from countries having state-managed medicine state that the insured have not been satisfied with the new system. Restrictions of the means of healing have been offensive to them, they have looked on the contributions to the sickness insurance system, taken from them through their employers by compulsion, as a retained share of their wages. They knew that they could obtain this retained money only in the form of insurance medical service or cash benefits, they believed they had been compelled to pay out money without receiving an equivalent, the only way in which the money or an equivalent could be recovered was to declare themselves sick and to meet the conditions set down by the law, this was an easy matter.

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If there is truly any lack of good medical service for those who require it, the medical profession stands ready now, as it has invariably stood in the past, to supply that service. What other profession has ever developed such a tradition of sacrifice for the public welfare? It has been said that the rich and the poor get the best of medical care, and that the members of the great middle class suffer because they are unable to pay the costs of modern medical service.

The proponents and agitators for some radical change in the method of distributing medical services have made some serious and startling charges concerning the methods now in use. They continue to assert that 50 per cent of the population receives no medical care. A survey of some 38,600 persons made by the Committee on the Costs of Medical Care showed that 47.1 per cent had no illness over a period of more than a year. The study also showed that 47.9 per cent of these persons had the services of physicians. Only 5 per cent of the persons involved in the survey were presumably in need of medical services but for some reason did not avail themselves of medical care. Perhaps 5 per cent is not too large an estimate of those who because of human characteristics manifested as ignorance, stupidity or prejudice prefer cultism, patent medicines, the advice of friends or relatives or no medical service at all.

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These proponents and agitators have charged that the medical profession is static and obstructive. But without any compulsion from political or governmental sources, the profession has sought constantly to advance the standards of medical education, medical licensure and hospital practice, and is now making notable progress in the certifica-

tion of specialists. To a remarkable degree these objectives are being accomplished. Today both curative medicine and preventive medicine have advanced to new and higher planes of efficiency. The profession is constantly perfecting methods of diagnosis and treatment, there has been a striking reduction in the prevalence of certain communicable and infectious diseases, infant mortality has been greatly reduced, and in the past century life expectancy at birth has been increased from twenty-eight years to almost sixty.

These meddlers with medical practice assert that present methods in the United States are costly and inefficient. In countries having state-managed medicine, there are as many bureaucratic employees as there are physicians giving medical service. State-managed medicine imposes such extensive red-tape, record-keeping and political interference, dominance and control on the physicians practicing under the system that they cannot devote the time they should to the actual practice of medicine. Loading the system with unnecessary bureaucratic personnel and with political meddling and direction tend to increase the cost of medical service and at the same time to reduce its quality.

It is claimed by the supporters of social reform in medicine that state-managed medicine will raise the standards of medical practice, deal a death blow to cultism and quackery and encourage preventive medicine and immunization. Standards of medical practice have advanced faster in the United States with free and independent medical practice than in any country having state-managed medicine. Germany, after fifty-four years of sickness insurance, is the happy hunting ground for quacks. It is the only nation to give official recognition and endorsement to all forms of quackery. Preventive medicine in the United States is the envy of the medical profession in many foreign nations.

The medical profession has always been its own most severe critic, and notwithstanding the advances that have been made toward a better understanding of disease and its control, it recognizes that there are some conditions and practices that should be corrected. For example, there are areas in which there seems to be an uneven distribution of physicians and other medical facilities, and in which the evils of contract and corporation practice should be corrected, the alleged abuse of clinic and hospital facilities should be investigated, the unwarranted practice of medicine by boards of health and boards of education eliminated, the medical phase of workmen's compensation improved and the dangers in group hospitalization recognized and averted.

In all these and many other problems confronting medicine, there are both ethical and economic

dilemmas. The fundamental concept in both ethics and economics is that of value. In economics the ultimate test of value is the amount of goods which will be consumed or the medium of exchange which will be paid in the market. Ethics embraces a wider conception, and makes as its ultimate test of value the effect on the individual and on the society in which he lives. Medical ethics deals with direct individual and personal services between whole personalities. Medical relations cannot exist between an oculist and an eye, a corporation and a broken law, a hospital and a disease, a laboratory and a blood specimen or an insurance policy and a compensation case. If medical relations are to be ethical—that is, in furtherance of the ultimate good health of the patient—they must be between the patient who is to be treated and the physician, trained according to established standards and having access to the accumulated knowledge of the ages.

To combat the agitation for drastic changes in medicine, the medical profession must continue to practice good medicine. It has been accused of being individualistic. This criticism should be accepted as a compliment insofar as the diagnosis, treatment and close personal confidential relations of private practice are concerned. Physicians must continue to be individualistic and ethical in their private ministrations to maintain health and to alleviate sickness. But they must speak and act collectively on matters pertaining to economics, public relations, legislation, the preservation of professional ideals and traditions, and the maintenance and advancement of medical ethics and the standards of medical education and practice.

There is within the medical profession in the United States a small but loudly vocal minority which would hasten the advent of some form of state-managed medicine, with all its methods of mass production, assembly-line technic and political dominance and control. These few physicians do not speak for the vast majority of substantial and representative physicians who cherish the free and independent practice of ethical medicine. This noisy minority does, however, appeal to and has the support of a group of non-medical propagandists and agitators who see in a system of state-managed medicine an opportunity for position, power and plunder. A few physicians whose acts and statements are filled with scorn, ridicule and derision for the ideals, traditions and ethics of medicine must not be permitted to speak for reputable and substantial physicians who believe in the institution of ethical medicine.

Quacks are abroad plying their trade in the realms of economics, sociology and ethics as well as in the field of medicine. Large groups of people

under the stimulation and leadership of these extremists and self-styled experts are assuming to know that which they do not know. They are contemptuous of the experiences of the past, they decry special skill, they substitute rhetoric for reason. The large and representative group of ethical physicians have an obligation to unite solidly in sentiment and in action against the utterly false representations of the reactionary, radical, self-styled experts who would destroy medical values that have required generations and centuries of accumulated scientific effort and experience to acquire.

The medical profession has not discharged its entire obligation to society by healing the sick or preventing disease. Its broader obligation lies in a concerted determination and effort to preserve that form of practice which best conforms to good public policy and which will perpetuate the free, independent, scientific and ethical institution of medicine.

The important question is this

Shall medicine continue to be practiced by men and women who are scientifically trained and who are devoted to the relief of suffering humanity, or shall the practice of medicine be taken over by a group of medically untrained bureaucrats who will use the medical profession as a tool and the sick as clay in moulding a huge political machine?

The obligation of the medical profession seems clearly defined. It must vigorously resist all efforts that are likely to provide sick people with the mere dregs of medical service, or that are destined to reduce medicine to the serfdom of science.

Now that the economic phase of medical practice is demanding more consideration, ethical relations must not be forgotten or removed from the central position they have always held. On the contrary, economic relations and plans, just as much as professional services and conduct, must be tested by the principles of medical ethics. Medical ethics is not outgrown or antiquated, it must continue to be vital, elevating, dominating and enduring through continual respect and adherence.

When physicians become, if they ever should, mere robots, making diagnoses from card indexes and mechanical gadgets and prescribing treatment from prepared and numbered labels, and when patients become a mere collection of interesting human parts to be shunted from one corner to another of a medical repair shop for some heartless and pseudoscientific tinkering, America will have lost one of its greatest institutions,—free and independent medicine,—and the American people will have lost some of their most valuable human traits, namely confidence in, respect for, and reliance on the scientific men and women who protect their health and prolong their lives.

PRIMARY THROMBOSIS OF THE AXILLARY VEIN

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THROMBOSIS of the axillary vein following strain (effort) has been comprehensively described by Matas.¹ Primary or idiopathic thrombosis occurring spontaneously is rare. We report below a case in which no etiology could be found and in which studies by means of an opaque medium visualized the obstruction.

CASE RECORD

C. F. M., aged 32, married, was admitted to the Boston City Hospital on May 4, 1935. Two weeks before admission he had had an upper respiratory infection accompanied by a slight cough, which cleared up in the course of a week. He was not incapacitated and aside from a healing herpes simplex on his upper lip there were no residual effects. Five days prior to admission the patient felt some discomfort in the left shoulder. There was, however, no spontaneous pain or pain on motion, and no areas of tenderness were present. This condition per-

sisted for about 3 days. Two days before entry the patient noted that his left upper extremity felt heavier and appeared larger than his right. He reported to the Out-patient Department of the Boston City Hospital, where the condition was diagnosed as venous thrombosis. X-ray photographs were taken, and the patient was sent home to rest. He was seen at home by one of us (J. A. F.), who sent him to the hospital.

His past history was important only in that he had indulged in alcohol quite freely at times. The family history was noncontributory. The patient was an electrician's helper by occupation. He was right handed.

Physical examination showed a robust young man whose general condition was entirely normal except for the findings revolving around his complaint. The neck showed no adenopathy, the thyroid gland was not palpable, and there were no abnormal pulsations. The lungs were clear and resonant throughout, there were no rales or abnormal breath sounds. The heart showed no murmurs or thrills, and the rhythm was regular. There was no displacement of the cardiac dullness. The lower extremities showed no varicosities.

The left upper extremity was larger in circumference than the right, and the skin was colder and darker. There was a definite increase in the number of visible superficial

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veins, and the veins were much more prominent than in the right extremity. Palpation of the left axillary vein was accompanied by a slight degree of tenderness. The vein presented a typical cord like tumefaction. There were no changes in the reflexes, and no motor or sensory changes. The radial, brachial and axillary arteries were easily palpable. On the anterior thoracic wall many dilated venules were visible, and the skin of the upper half of the thorax anteriorly on the left side seemed slightly darker than the skin elsewhere.

The laboratory findings were as follows. The urine had a specific gravity of 1.027, with no albumin and no sugar,



Figure 1

the sediment was negative. The hemoglobin was 74 per cent. The red-cell count was 4,500,000, and the white-cell count was 8000, with 68 per cent polymorphonuclears, 21 per cent lymphocytes, 5 per cent monocytes, 3 per cent eosinophils and 3 per cent basophils. The blood Kahn test was negative, and the nonprotein nitrogen was 27 mg per cent. A blood culture showed no growth.

A tentative diagnosis was made of thrombosis of the axillary vein, with a suspected mediastinal mass on the left side or possibly a cervical rib.

Visualization of the vein was undertaken in order to rule out the possibility of pressure by an obscure mass, to locate the site of obstruction, to note changes in the contour of the distal portions of the vein, and to observe the nature of the collateral channels. For outlining the course of the vein we first used Skiodan. The injection

was carried out in the x-ray department and the films were taken during the injection. The injection, which was done about 2 weeks after the onset of the symptoms, was reported as follows: "Examination of the left upper arm after the injection of Skiodan [Fig 1] in the ante cubital vein shows a portion of the brachial and the axillary vein outlined. The brachial vein is considerably narrowed and one of the valves is markedly dilated. The collateral branches cannot be traced. These findings are consistent with thrombosis of the brachial and axillary veins. An infrared photograph taken at this time demonstrated the venous collaterals in the arm and chest (Fig 2)."

Following his discharge from the hospital, this patient resumed his occupation and has worked without interruption. He has never noted any swelling or pain, or



Figure 2

indeed any symptoms referable to his arm. Subsequent examinations showed no special prominence of the veins on the left upper or lower arm as compared with those on the right. Tests for hydrostatic effects were negative, and measurements revealed no material difference.

This patient was last seen 14 months after leaving the hospital. On this occasion he reported that he was still free from symptoms. The examination of the extremity and a general physical examination were both negative, so that on the basis of clinical findings there was nothing to indicate any alteration in the circulatory function of the affected arm. At this time an x-ray film (Fig 3) taken after the injection of 10 cc of Hippuran showed the entire axillary vein well outlined, its caliber slightly larger and some of the branches partially outlined. One of the branches of the axillary vein could be traced. The valves were not so dilated as they had been at the previous examination. There were no changes in the humerus or in the surrounding soft tissue.

In general, cases of axillary thrombosis fall into one of three groups. The first comprises those sec-

We are indebted to Dr. Edward A. Edwards for the infrared photograph.

ondary to intravascular or extravascular inflammatory processes or extravascular pressure from contiguous neoplasms or enlarged nodes. The second group comprises cases resulting from a sudden strain or other trauma. In the third group are included a small proportion of cases which in the absence of any known trauma must be classified as idiopathic, yet in these it is impos-



Figure 3

this apparent paucity, the impression prevails that many cases have never been reported. This applies particularly to the American literature. Cases of primary thrombosis of the idiopathic type have proved even rarer.

The mechanism of the development of the condition remains obscure, and many theories have been developed to account for it. Von Schrötter,³ who reported the first case, regarded it as a localized phlebitis resulting from the sudden traumatic stretching and compression of the vein. Subsequent studies led to the theory that the trauma occurred between the clavicle and the first rib, with the costocoracoid ligament and the subclavius muscle as contributing factors. Slowing of the circulation, rupture of the subclavioaxillary valve, venospasm induced by sympathetic irritation of traumatic origin, a tear in the wall of the vein—these and several other factors have been invoked. The reader is referred to the exhaustive articles by Matas¹ and Veal and McFetridge⁴ for a complete discussion of this subject. The lack of autopsy material has proved a distinct handicap in determining the pathogenesis.

Veal and McFetridge⁴ studied the problem both in the living subject and in fresh autopsy material. They report 2 cases of primary thrombosis. They approached the subject by vasographic studies on normal subjects, using Thorotrast (colloidal thorium dioxide) as the opaque medium. They noted that anatomical relations changed when the factor of movement was introduced; the axillary vein was capable of accommodating itself to moderate changes in position. On hyperabduction and external rotation, there was a compression of the vein as the subscapularis muscle came to lie between the vein and the head of the humerus. They determined that the obstruction occurred at the point where the vein passed over the subscapularis muscle in the position of hyperabduction and external rotation. In this position the emptying time was shorter rather than longer. Additional observations demonstrated that the important factor in raising the venous pressure is not the position of the arm, but rather the increased thoracic pressure which is caused by coughing or straining.

COMMENT

The absence of an etiologic background has forced us to assume that the case herein reported belongs to the rare group of idiopathic or primary axillary thrombosis. The patient was known to have indulged freely in alcohol, but no alcoholic bout preceded the onset. It is doubtful whether alcoholism per se plays any role other than through

sible to rule out trivial trauma or, as Matas terms it, 'banal' trauma. The second and third groups are characterized by the sudden development of edema, pain in the affected extremity, varying degrees of cyanosis, and a palpable cord-like mass, often tender, representing the axillary vein.

The literature concerning axillary thrombosis caused by strain was adequately reviewed by Matas¹ in 1934. Paggi's² survey resulted in the collection of only 74 reported cases up to July, 1933. Despite

the traumatism that may accompany it. We have admitted annually to our service approximately 850 patients with acute alcoholism, some in a severely toxic state. The rarity of axillary thrombosis among these individuals goes to prove that alcoholism plays no direct part in the etiology of this disease.

Along with the distinctive characteristics typifying the condition in our case, there were several atypical features. The onset was gradual, and was unaccompanied by pain. The edema was also relatively slow in development. There was only slight tenderness on palpation of the vein. The patient was right-handed, and the left axillary vein was the seat of thrombosis.

SUMMARY

An additional case of primary thrombosis of the axillary vein is reported. We have placed this in the idiopathic group because of the absence of trauma or any other inciting cause. Vasography revealed the site of the thrombosis. A follow up vasogram taken fourteen months later still showed some radiographic deviation from the normal.

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REPORT OF TWO CASES OF BOTULISM IN MASSACHUSETTS

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BOSTON

DURING the period 1899-1935, botulism has been reported only six times in the New England States.¹ Only once in the United States has it been reported as being acquired through the ingestion of home-canned mushrooms. It is of interest, therefore, to report 2 such cases which occurred recently in Cambridge.

Case 1. C. P., a 48-year-old man, on January 16, 1937, ate some wild mushrooms which had been picked 6 months before in the woods of a nearby suburb and canned at home. Previously, the home-canned mushrooms had always been reheated before being served. This time, however, they were not. No effect was noted that day or the next, when the man again ate a jarful of these mushrooms, unheated. On January 18 he arose with a dizzy headache, and was nauseated and unable to see distinctly. He went to work, but soon returned home because of his inability to see what he was doing. There was no vomiting, and he had no bowel movement that day. His tongue felt stiff, he could not swallow well, his speech became thick, and he then began to see double. At this point he was sent to the Cambridge Hospital by Dr. J. P. Nelligan, of Cambridge, with whose permission these cases are presented.

Physical examination revealed a well-developed and well-nourished adult male, rational and co-operative but slightly drowsy, and complaining of blackness before his eyes. The temperature was 97.2° F., the pulse 60 and the respirations 20. The blood pressure was 110/70. Paralysis of all the ocular muscles was present. Print could not be read, the patient stating that he saw double. The optic disks were pale. The face was slightly puffed out on the right side. The tongue and jaw were deviated to the right. The palatal reflex was absent. The speech was thick and slurring and the enunciation of words was impaired. There was difficulty in swallowing, with regurgi-

tation of fluids through the nose. The breath was foul. There was no stiff neck. Generalized muscular weakness was present. Tendon reflexes were exaggerated. The abdominal reflexes were absent, the Babinski response was present bilaterally, but there was no Kernig or clonus.

The patient grew worse while on the ward, he was totally unable to swallow, choking and gagging when taking fluid and regurgitating it through the nose. The speech became mumbling. His mind remained clear at all times.

The urine gave an acid reaction and had a specific gravity of 1.026, it contained no sugar or albumin but showed a 2+ acetone reaction, the sediment was negative. The white-cell count of the blood was 5100, and the red-cell count 3,280,000. The hemoglobin was 62 per cent (Sahlb). A blood Hinton test was negative. The spinal fluid had an initial pressure equivalent to 170 mm of water, dynamics were normal. The fluid was clear and colorless and no cells were found, the total protein was 29 mg and the sugar 77 mg per 100 cc.

A clinical diagnosis of botulism was made, botulinus antitoxin was sought, but could not be obtained until the following morning. In the meantime 1/4 gr. of morphine was given every 4 hours, and a hypodermoclysis of 1500 cc. normal saline and 5 per cent glucose was administered. Then 20,000 units of a polyvalent botulinus antitoxin (Lederle—labeled "for use in animals") was given intravenously at regular intervals over a 12 hour period, the patient first being tested for serum sensitivity. He was then transferred to the Boston City Hospital and placed in a respirator because of beginning respiratory distress. However, this complication cleared within 1 day. At that hospital he received an additional 115,000 units of the polyvalent antitoxin in divided doses at regular intervals. Clyses and intravenous solutions of 3000 cc. of fluid were given daily. Serum sickness developed a week later and soon cleared up. The paresis of the larynx and pharynx continued until the 12th day after entry, when the patient began to swallow small amounts of fluid. From then on he took his own nourishment. The cranial nerve palsies subsided. He slowly regained

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strength and at the time of discharge it had returned to a remarkable degree, although there was considerable generalized wasting of subcutaneous tissue. On February 13, or 26 days after the onset of the disease, he was discharged improved.

When seen 9 months later, he had completely recovered

Case 2 M. P., aged 43, the wife of the patient in Case 1 was admitted to the Cambridge Hospital on January 20, 1937, with a history of nausea, difficulty in swallowing, weakness and blurred vision of 1 day's duration.

Four days before entry she ate a small amount of the above mentioned home-canned mushrooms which had not been reheated. She was well for 3 days, or until January 19, when she began to feel nauseated, became weak, and developed progressive difficulty in swallowing and blurring of vision. She was then sent to the hospital.

On admission the temperature was 97°F, the pulse 115, and the respirations 20. The blood pressure was 160/100. Physical examination revealed a flushed face, unsteady gait and nasal speech. The patient continually cleared her throat in an attempt to get rid of the mucus. There was a right-sided facial palsy of peripheral type. She was unable to read print because of blurred vision. The eyes showed a partial paralysis of all the extrinsic ocular muscles. Both optic disks were pale. The breath was foul, the tongue was coated and deviated to the right. The palatal reflex was absent. There was a marked inability to swallow, and attempts to take fluid caused gagging and choking. The neck was slightly rigid. The heart and lungs were negative. There was marked weakness of the arms and legs. Abdominal reflexes were absent on the left, and a Babinski response was present on the left, but there was no clonus or Kernig.

On January 20, the urine showed an acid reaction and a specific gravity of 1.016. There were no sugar and no albumin, but a heavy trace of acetone. The sediment was negative. The white-cell count of the blood was 14,000, with 85 per cent polymorphonuclears, 12 per cent lymphocytes and 3 per cent monocytes. The red-cell count was 4,500,000, and the hemoglobin 85 per cent (Sahli).

The patient could take nothing by mouth for the next 3 days, and received 3000 cc. of fluids intravenously and by clysis each day. A total of 50,000 units of polyvalent botulinus antitoxin was administered in the following doses: 5000 units in divided amounts was given in the 1st hour intravenously, the next morning 25,000 units was given with the clyses and intravenous infusions, that afternoon 5000 units was given intramuscularly, the third day 10,000 units was given with the clyses, and on the 4th day, when definite improvement had been noticed, only 5000 units was given with the clyses.

By that time the patient's vision had improved to the extent that she could read print, the nasal tone of the voice was markedly lessened, and she no longer kept clearing her throat. Her eye condition remained about the same, but the palatal reflex returned, and she was able to swallow small amounts of fluid without choking or regurgitating through the nose. The Babinski response became equivocal.

From then on she steadily improved, except for a serum reaction which developed on January 27, and was successfully treated by adrenalin and magnesium sulfate and calcium lactate by mouth. Her weakness gradually disappeared, and the gait soon improved and became normal. On discharge, February 6, or 18 days after admission, she showed only a very slight residual weakness of the eye muscles.

The patient was completely recovered 9 months later.

Attempts to prove the presence of the botulinus bacillus or its toxin were unsuccessful. Unfortunately there was no sample of the unheated mushrooms of the first jar from which both patients had been served. Some mushrooms from another jar were found in a garbage can on January 21. These and an unopened jar were sent to the Bacteriology Department of the Tufts College Medical School, and also to the Antitoxin and Vaccine Laboratory of the Massachusetts Department of Public Health. Cultural and animal inoculation tests were negative for *Clostridium botulinum* or its toxins, hence only a clinical diagnosis of botulism could be made.

DISCUSSION

The early recognition of botulism is very important, so that antitoxin may be administered promptly. Botulism is an acute poisoning caused by the toxin of *Clostridium botulinum*.² The bacillus is essentially a soil organism and is found in dust, dirt, carrion, fruit, vegetables and plants. Under anaerobic conditions the growing bacillus produces a thermolabile poisonous toxin, which when ingested affects primarily the cells of the central nervous system. Mushrooms, the food ingested in these cases, have only once been reported as the carrier of the bacillus or its toxin. Botulism should be seriously considered in every case of poisoning caused by the ingestion of canned mushrooms.

The incubation period usually varies from eighteen to thirty-six hours after ingestion of the toxin, but symptoms may occur as early as two hours and as late as eight days after.³ The period was

Table 1 Signs and Symptoms of Botulism

REPORTED SIGNS AND SYMPTOMS	CASE 1	CASE 2
Constipation	+	+
Fatigue, with vertigo and headache	+	+
Paresis of ocular muscles producing disturbance of vision	+	+
Loss of light reflex	—	—
Paresis of pharyngeal and lingual muscles, producing dysphagia and dysphonia	+	+
Generalized muscular weakness	+	+
Absence of sensory disturbances	+	+
Subnormal temperature	+	+
Slow pulse	+	—
Disturbance of respiration	+	—
Mental alertness	+	+
Absence of vomiting and diarrhea	+	+

forty-eight hours in Case 1 and seventy-two hours in Case 2. Early constipation, an outstanding symptom of botulism, was present in both patients. Disturbance of vision was caused by paresis of the ocular muscles, and was a prominent symptom. Fatigue, with vertigo and headache, was soon followed by generalized muscular weakness, this being the usual course of the disease. Loss of the light reflex, which may or may not occur, was not present. Within a short time there was a

paresis of the pharyngeal and lingual muscles, producing difficulty in swallowing with regurgitation through the nose, and difficulty in talking. This group of symptoms is very common in botulism. The absence of sensory disturbances, diarrhea and vomiting, and the presence of mental alertness, subnormal temperature and a slow pulse in our patients corresponded unusually well with the textbook description of the disease.

The duration of the disease varies from two to twenty-six days. When recovery occurs, convalescence is slow and tedious. Disturbance of vision is usually the last symptom to disappear, and may persist for months. There seems to be no permanent severe disability after recovery. Where death occurs, it is usually caused by a terminal bronchopneumonia or by respiratory paralysis.

The differential diagnosis includes mushroom poisoning, bulbar poliomyelitis, encephalitis and food infection. Mushroom poisoning had to be ruled out first in these cases. In botulism the incubation period is long, because the bacillus produces a toxin which mediates its symptoms through the central nervous system, while in mushroom poisoning the period is much shorter, the poison directly affecting the gastrointestinal tract, with subsequent vomiting, diarrhea and abdominal cramps. The latter poison may also produce nephritis with anuria or hemoglobinuria, mental confusion, excitement and convulsions, and excessive perspiration and lacrimation. Bulbar poliomyelitis and encephalitis were seriously considered, but in view of the fact that the spinal fluid findings were entirely negative, they also were ruled out. Food infection (so-called ptomaine poisoning) was ruled out by the absence of gastrointestinal symptoms such as vomiting, diarrhea and abdominal cramps, by the absence of fever, and by the presence of marked disturbance in the central nervous system.

Meyer¹ quotes Velikanoff⁴ as showing that in a series of 194 Russians poisoned by botulinus toxin 119 were treated with antitoxin and 24,

or 20 per cent of those treated, died. Seventy of the 75 untreated cases died, a mortality of 93 per cent. In the experience of the Russian observers, one may expect a reduction in the mortality of botulism provided the antitoxin is administered within the first seventy-two hours after ingestion of the botulogenic food. Large doses should be administered early either by intramuscular or intravenous route, the latter being preferable. Case 1 received 135,000 units without harmful effects other than a mild serum reaction.

Supportive treatment consisting of 5 or 10 per cent glucose in normal saline solution by clysis or intravenous route is an important measure. Rosenau² states that the patient should be kept under the full influence of morphine until the antitoxin is obtained, for in the experimental disease this opiate delays the action of the toxin. The stomach should be washed out and the bowels purged with an active cathartic. A respirator should be available in case of respiratory failure.

SUMMARY

1 Two cases of botulism, clinically diagnosed and following the ingestion of home-canned mushrooms, are reported. Recovery took place in both cases, polyvalent botulinus antitoxin being administered within seventy-two hours after ingestion of the food, and twenty-four hours after the onset of the symptoms.

2 Only 6 cases of botulism have been reported in New England in the period 1899-1935, and in the same period only 1 case in the United States has been attributed to eating mushrooms.

3 Early recognition of the disease, with prompt administration of the antitoxin, is important in reducing the mortality.

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ANAPHYLAXIS TO SODIUM MORRHUATE FOLLOWING
INJECTION TREATMENT OF INTERNAL HEMORRHOIDS

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BOSTON

SINCE the introduction in 1929 of sodium morrhuate as a sclerosing agent, it has attained considerable popularity in the treatment of varicose veins, hydroceles, olecranon and prepatellar bursitides and internal hemorrhoids. The purpose of this paper is to report 2 cases of constitutional anaphylactic reactions which have occurred following its use in the injection of internal hemorrhoids. Probably many other such reactions which have taken place have not been reported. They constitute a distinct hazard, and should be guarded against.

In reviewing the literature we find that Cooper¹ in 1933 reported a mild dermatitis with an annoying pruritus following the use of 10 cc of a 5 per cent sodium morrhuate solution.

Allergic-like reactions to this agent when employed for the obliteration of varicose veins have been reported by Zimmerman² and Lewis.³ Praver and Becker⁴ from their dermatologic clinic reported untoward reactions in 7 out of 126 patients who received 783 injections of a 5 per cent solution.

According to Haines,⁵ the mechanism of its action is somewhat obscure, and no criteria as to what constitutes sodium morrhuate have been laid down. He states that some commercial samples were analyzed, with a view to ascertaining the degree of uniformity attained by various manufacturers. Examination disclosed considerable differences between the solutions: some were clear at room temperature, while others were turbid or gelatinous or contained a crystalline sediment. The solutions were analyzed for the content of fatty acids and for their iodine value. It was found that sodium oleate is both more toxic and less active as a sclerosing agent than are the sodium salts of the more highly unsaturated fatty acids. The iodine value rises as the elimination of oleic acid from the unsaturated fraction becomes more complete.

Sodium morrhuate is a mixture of the sodium salts of the unsaturated fatty acids occurring in cod-liver oil, and it is thus impossible to give its chemical formula. Originally, the name "morrhuc acid" was given by Gautier and Mourges to a nitrogenous putrefaction product, hydroxydihydropyridine butyric acid ($C_9H_{13}NO_3$), found in rotted cod-liver oil, but this term is now applied to

the product obtained following the hydrolysis of purified cod-liver oil. This impure morrhuc acid is then neutralized with caustic soda, and is further purified by partial fractionization in order to give a sodium morrhuate suitable for medicinal use.

Zimmerman² has raised the question whether the saponified fatty acids themselves are capable of producing an allergic reaction, or whether the latter is due to an admixture with liver protein. Another theory which has been offered is that hemolysis may occur, the contact of the patient's blood with the solution resulting in liberation of protein substances which are responsible for the reaction. Still another theory, advanced by Lewis,³ is that sodium morrhuate may act as a hapten and sensitize susceptible individuals, particularly if they have received an injection one or two weeks before.

I have used a 5 per cent solution of sodium morrhuate in the injection of large internal hemorrhoids in 75 cases. In 2 cases in this series severe constitutional anaphylactic reactions were noted, and are here reported.

Case 1 Mr W, aged 30, was seen on February 14, 1937, and gave a history of bleeding from the rectum for 3 months. Palpation of the anus and rectum disclosed no new growths, polyps, fissures or fistulas. Proctoscopic examination brought into view a ring of internal hemorrhoids. Sigmoidoscopic examination to a depth of 23 cm. was negative. One cubic centimeter of a 5 per cent solution of sodium morrhuate was injected about the posterior right internal hemorrhoid. The plunger of the syringe was withdrawn before the injection was started in order to make sure that the needle did not enter a vein. No untoward reaction occurred.

One week later 1 cc. of sodium morrhuate was injected, this time into the region of the posterior left internal hemorrhoid. The patient immediately complained of feeling ill and very warm. He also felt dizzy and nauseated. He paled markedly, perspiration became profuse and the respirations shallow, the pulse was imperceptible, and the blood pressure dropped to 60/0. A subcutaneous injection of 1 cc. of a 1:1000 adrenalin solution was given immediately. Spirits of ammonia were also administered. The attack lasted for 20 minutes. After resting for about 1 hour he was allowed to return to his home. He reported that he felt badly for 2 days following the injection. The suddenness and severity of this attack, as well as the danger of immediate death, showed the advisability of using another sclerosing solution for this patient.

Case 2 Miss K., aged 22, was seen on May 10, 1937 and complained of profuse bleeding from the rectum and rectal prolapse. Proctoscopic examination brought into view large internal hemorrhoids which prolapsed on

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withdrawal of the proctoscope, no other lesions were seen. Operation was advised, but was refused in favor of injection treatment. An injection of 1 cc of 5 per cent solution of sodium morrhuate was made under the mucosa above the internal hemorrhoid in the right lateral anterior quadrant, with care not to inject directly into the vein. The patient was asked to return in 1 week. No reaction except a sensation of fullness in the rectum was experienced. The patient returned in 2 weeks, and was again injected with 1 cc. of 5 per cent solution. Immediately after the injection she complained of nausea, pain in the lower abdomen, a desire to defecate, a feeling of weakness, and dyspnea. The face became pallid, the radial pulse was not felt, the pupils became dilated, and the blood pressure was 64/0. A subcutaneous injection of 1 cc. of a 1:1000 solution of adrenalin was given immediately, and a teaspoonful of spirits of ammonia in water was given by mouth. The attack lasted for 20 minutes, and the patient was allowed to leave the office after resting 1½ hours. She complained of feeling ill for 1 day. The drug was not used at subsequent visits.

DISCUSSION

It is well known that a drug idiosyncrasy may give symptoms identical with those observed in patients sensitive to pollens, foodstuffs or other material containing protein. The 2 cases just reported show that the severe anaphylactic reaction obtained by the use of sodium morrhuate can threaten the life of a patient. If this reaction is allergic, precautions identical with those taken against subcutaneous or intravenous medication with a foreign protein or protein-like substance must be observed in the use of sodium morrhuate as a sclerosing agent, whether for internal hemorrhoids or for any other condition. It might be well in each case to test for sensitivity to sodium morrhuate before using it. A patient may become hypersensitive to the drug if more than from seven

to ten days elapse between injections. In this event, immunization should be undertaken with small doses, beginning with 0.2 cc injected intradermally. To alleviate the extreme anaphylaxis in severe cases, 1 cc of adrenalin in 1:1000 solution should immediately be given subcutaneously. An ampule of coramine or atropin, gr 1/150 or 1/75 respectively, should be given hypodermically if there is cardiorespiratory embarrassment. In extreme cases artificial respiration should be resorted to.

SUMMARY

The use of a 5 per cent solution of sodium morrhuate for injections of internal hemorrhoids should be accompanied with the greatest of care in patients who have received previous injections with this solution, as well as in those receiving it for the first time.

Several theories have been advanced as to the causes of anaphylactic reactions from injections of sodium morrhuate.

Two cases of severe anaphylactic reaction are reported.

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CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITALANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24121

PRESENTATION OF CASE

First admission A thirty-one-year-old, white, steam shovel operator entered the hospital with the complaint of headaches of ten days' duration.

Ten days before entry he fell on the stairs of a subway station, striking the back of his head. He felt a little dizzy and about an hour later suddenly felt nauseated and vomited. About two hours later he again vomited and developed a severe generalized headache. He was able to sleep that night and went to work the following morning. For the next six days he worked regularly but felt poorly, vomited frequently, and had severe, almost constant headache, neck pain, and low-back pain. Three days before entry he went to bed because of constant nausea. He was unable to eat anything, and the back pain became increasingly more severe. He noticed slight deafness in his left ear and had temperatures ranging from 100 to 101°F.

Twelve years before entry the patient slipped and struck the back of his head. He lost consciousness and remained unconscious in a hospital for seventeen days. The entire right side of his body was paralyzed, but he recovered completely and except for temporary deafness in the right ear remained free of symptoms until two years before entry when he was hit on the head and developed diplopia. Double vision had continued up to entry. His wife and four children were living and well. His past history and family history were otherwise noncontributory. He denied venereal disease.

Physical examination revealed a well-developed and nourished, slightly deaf man complaining of pain in the neck and back which was increased by moving. His heart, lungs and abdomen were negative. The neck was very stiff and painful on motion, and there was tenderness along the entire spine. Kernig's sign was positive and the reflexes were active and equal. There was weakness of the left external rectus muscle with diplopia to the left. The right pupil was larger than the left, but both reacted well to light and accommodation. There was slight weakness of the left side of the face, and hearing was poor in both ears. There was diminished sensation over the entire right side of the body, but vibration and position senses were normal. Motor activity was normal,

and there were no signs of cerebellar abnormality.

The temperature was 100.5°F, the pulse 47. The respirations were 26.

The urine examination was negative. The blood showed a red-cell count of 4,900,000 with 80 per cent hemoglobin and a white-cell count of 12,000 with 80 per cent polymorphonuclears. A blood Hinton test was negative. A lumbar puncture showed an initial pressure of 350 mm with normal pulse and respiratory oscillations. The spinal fluid was pink in color and contained 15,625 crenated red cells and 270 white cells per cubic millimeter, 78 per cent of the latter were polymorphonuclears. The Wassermann test was negative, the goldsol curve was 1333332100, and the sugar was 60 mg per cent.

X-rays of the skull and spine showed no evidence of fractures.

A second lumbar puncture two days after entry showed an initial pressure of 350 mm. The fluid was xanthochromic and contained 960 red cells. His condition improved slowly, and in two weeks he had only slight residual stiffness of his neck. At that time a lumbar puncture showed an initial pressure of 155 mm. The fluid was clear and colorless and contained no red cells, but did contain 25 lymphocytes. He was discharged on the twenty-first day.

Final admission (six months later) The patient remained perfectly well until the morning of entry when, while cranking an automobile, he suddenly developed severe pain in his head and neck. He went to work but felt sick and somewhat confused and therefore returned home later in the morning. He was given morphine, which afforded relief. Soon afterward, however, he became restless and vomited several times. The pain became more and more severe, and he finally lapsed into a semistupor.

Physical examination revealed a well-developed and nourished man in a semistuporous condition. His head was held back, his eyes were closed, and he was very restless. There was boardlike stiffness of the neck, and the Kernig sign was positive. The right pupil was larger than the left, and they reacted very slightly to light. There was blurring of the left optic disk. The reflexes were equal and active, but there were bilateral Babinski signs. The blood pressure was 110 systolic, 75 diastolic.

The temperature was 100.5°F, the pulse 80. The respirations were 27.

A lumbar puncture showed an initial pressure of 175, and the spinal fluid was grossly bloody. It contained 700,000 red cells and 500 white cells.

After a few hours he lapsed into a deep coma.

and began to have Cheyne-Stokes respirations. Two ventricular taps were done, both yielding grossly bloody fluid under a pressure of 360 mm. He died on the day of entry.

DIFFERENTIAL DIAGNOSIS

DR HENRY R VIETS. In summary this is a man of thirty-one who had three injuries to his head. At the age of nineteen he slipped and hit the back of his head, but he made a perfect recovery after a period of headache and vomiting. The second one was when he was twenty-nine, ten years later, and the third at thirty-one. A fourth and final cerebral episode resulted not from traumatic injury but from a strain six months later. It would seem as if we ought to connect all these episodes. The principal thing is that at each time he recovered practically entirely. He did have diplopia after the one at the age of twenty-nine which persisted, but from the first and third he made a complete recovery, which would suggest that we were not dealing with intracerebral disease but with intracranial disease on the surface of the brain. This and the evidence from spinal fluid examinations on the last two entries speak for subarachnoid hemorrhage. We make that diagnosis today more frequently than we ever did before. Blood in the spinal fluid in a young patient who recovers is practically always due to aneurysm. Occasionally we think of tumors, especially the blood tumors such as the angiomas. In spite of the fact that they are often on the surface they seldom bleed but give rise to Jacksonian epilepsy, which this patient did not have. The hemangioblastomas are practically always in the cerebellum and do not give rise to subarachnoid hemorrhage. We think, therefore, of aneurysm giving rise to four episodes of bleeding in this young man without very definite localizing signs. We shall have to say, knowing that aneurysms are usually in the circle of Willis and seldom elsewhere in the cranial vessels, that the aneurysm in this case was probably in the circle of Willis. I am not definitely able to say which part. The evidence for localization is not very good. He had a diplopia the last two years that may have been due to blood's penetrating the sixth nerve, but with its long intracranial course this sign does not help much in localization. He had weakness of the left side of the face. That would make us think of a lesion on the right side. On the other hand he had loss of sensation on the whole right side of the body, which would make us feel certain he had a lesion on the left side. He may have had two lesions, one on each side. It would seem that syphilis was not a factor. He is too young for arteriosclerosis, and it seems as though he had the usual congenital type of aneurysm which continued to bleed from time to

time giving this picture of chronic subarachnoid hemorrhage. The last and fatal one bled into the ventricles since the ventricular tap showed blood. He had bilateral Babinski signs and other more serious signs which are consistent with deep bleeding into the ventricle as well as the subarachnoid space.

DR TRACY B MALLORY. Dr Ayer, have you any comment?

DR JAMES B AYER. This man apparently had had attacks of bleeding nearly half his life. The one on the last entry happened when he was cranking his automobile. In other words something gave way on effort whereas the others were traumatic. I think the duration is enough to rule out most tumors. The hemangioma may run a long course but as Dr Viets said does not bleed spasmodically in this particular way. One would think of aneurysm or malformation of vessels rather than tumor. One questions whether some disturbance of vessels might occur from trauma which would subsequently bleed more easily. There might be a double lesion. Dr Kubik has spoken of a good many cases with double or multiple aneurysms.

There is one localizing sign in the first episode. He had double vision, and double vision is common, as Dr Albright first pointed out to us, in third-nerve palsy. It occurs in 50 per cent of the cases of aneurysm of the middle cerebral artery or at the junction of the cerebral and posterior communicating artery, which is the favorite place.

DR VIETS. The record says that there was weakness of the left external rectus muscle so it was sixth- and not third-nerve involvement. That is why I tried to point out that it did not help.

DR AYER. This also fits in with Dr Kubik's analysis of aneurysms to the effect that effort alone is often an explanation of bleeding. Several of our patients have had hemorrhage from the aneurysm on straining at stool.

DR MALLORY. By all odds the majority of vascular lesions that we find in patients with a history like this are arterial aneurysms in the neighborhood of the circle of Willis, but this case was not. It was a distinctly more unusual condition, which Dr Kubik will describe.

CLINICAL DIAGNOSIS

Subarachnoid hemorrhage, recurrent

DR VIETS'S DIAGNOSES

Subarachnoid hemorrhage, recurrent
Aneurysms, circle of Willis?

ANATOMIC DIAGNOSES

Hemorrhage, ventricular and subarachnoid
Aneurysmal varix

Bronchopneumonia
Pulmonary congestion and edema
Hydrohemothorax, bilateral

PATHOLOGICAL DISCUSSION

DR CHARLES S KUBIK Out of the cases of spontaneous subarachnoid hemorrhage which have come to postmortem examination in this hospital in the last seven or eight years, ruptured intracranial aneurysms accounted for 18, and I should say that not more than 6 or 7 were due to other causes, venous anomalies and hemangiomas of the choroid plexus being responsible for the majority. Considering the statistics and the similarity of the clinical manifestations produced by subarachnoid hemorrhage resulting from these various causes, ruptured aneurysm would be the logical diagnosis for anybody to make in this case. What we found was a saccular enlargement, 1.5 cm long and 0.7 cm in diameter, of a small vein lying against the inner surface of the left optic thalamus and entering the great vein of Galen with the left choroidal vein. Several very small, tortuous veins emptied into the sac. No connection with any of the arteries could be demonstrated.

DR MALLORY We do not ordinarily think of varicose veins as being of importance in cerebral lesions, but that seems to be essentially what we were dealing with here.

CASE 24122

PRESENTATION OF CASE

A forty-three-year-old Scotch laborer entered the hospital with the complaint of headaches of eighteen days' duration.

Eighteen days before entry while at work he noticed a sharp pain in the back of his neck and in the occipital region. He lay down for a while and then went home. The following day he went to see his doctor who prescribed Pluto Water. The next day he drove from Boston to New Brunswick on his vacation. His headache had continued intermittently and on the automobile trip was severe enough to prevent him from doing much of the driving. The headache continued during the subsequent two weeks and occasionally radiated to the frontal region. It was not sufficiently severe to keep him from having a fairly good holiday. Two days before entry his wife heard him make a very irrational statement which she knew to be wholly untrue. At the time of entry the patient was unable to give a clear-cut history. There were no data recorded relative to the mental changes during the two days prior to entry. All the information was given by his wife who was considered reliable.

His past history, so far as it could be obtained, was almost entirely negative. There had been a loss of 15 lb during the six months preceding his entry. He had no history of previous cerebral symptoms or of injuries of any importance. He had worn glasses for twenty years and had had them changed three months before entry. The diagnoses at that time were compound hyperopic astigmatism, hyperopia, and presbyopia. There was an indefinite history of a penile sore many years before entry. His wife had had one full-term child, which died twelve days after birth and three subsequent miscarriages. The family history was otherwise negative.

Physical examination revealed a well-developed and nourished middle-aged man. The heart, lungs and abdomen were negative, and the blood pressure was 140 systolic, 105 diastolic. He was somewhat disoriented and continually grasped the back of his head with his hands and grimaced as if in severe pain. He had no speech difficulty and yet was very slow in answering questions. There was no astereognosis. The Romberg sign was negative, and there was no nystagmus. Complicated movements were poorly performed, but the finger-to-nose and heel-to-knee tests were negative. The pupils were irregular, the right being larger than the left. The left pupil did not react directly to light, but did so consensually. The right reacted normally. The fundi were normal but the visual fields could not be determined. The cranial nerves were otherwise negative. Sensation was intact throughout, and motor activity was normal. The reflexes were active and bilaterally equal.

The temperature was 98.6°F, the pulse 75. The respirations were 18.

The urine examination was negative. The blood showed a red-cell count of 5,030,000 with a hemoglobin of 80, and a white-cell count of 12,500 with 73 per cent polymorphonuclears. The blood Hinton test was negative. A lumbar puncture showed an initial pressure of 210 mm with normal pulse and respiratory oscillations. The spinal fluid was clear and contained 6 lymphocytes per cubic millimeter, 47 mg per cent of protein, and 76 mg per cent of sugar. The goldsol curve was 0000000000, and the spinal fluid Wassermann was negative.

X-rays of the skull showed a calcified pineal gland displaced downward and backward. The pineal was not seen in the anteroposterior view.

His condition remained essentially unchanged for six days except that he became incontinent of urine and definitely drowsy. On the seventh day a ventriculogram was done. Dr Hampton's report reads as follows: 'The lateral ventricles are incompletely filled with air. There is no air in the third and fourth ventricles. The anterior and

inferior horns of the lateral ventricles are well demonstrated. The anterior horns are markedly displaced toward the left but they are approximately normal in size. There appears to be a filling defect in the body of the right lateral ventricle, and the body of the left lateral ventricle is incompletely filled at the same point. The inferior horn on the right is small and displaced downward whereas the inferior horn on the left is dilated and in normal position."

On the same day an operation was performed

DIFFERENTIAL DIAGNOSIS

DR. ROBERT S. SCHWAB. In discussing the differential diagnosis I shall divide the symptoms and points in the history into three groups. First, those which I consider irrelevant, secondly, those which may be relevant, and thirdly, those I feel sure are relevant. The giving of Pluto Water, his wife's miscarriages, and the question of penile sore with negative Hinton and spinal fluid Wassermann I consider irrelevant. Now as to the second group—those that might be relevant—we have eye trouble. I presume he must have been to an oculist to get the eye diagnoses. He had lost 15 lb. in weight. He had a white count of 12,500 with 73 per cent polymorphonuclears. He also had slightly elevated spinal-fluid sugar and protein. As to third group I believe the following are definitely relevant: the left pupil fixed to light but with indirect consensual reflex to light, and the normal right eye, he also made an irrational remark, he could not perform complicated movements, he was stuporous and drowsy, the pineal was displaced downward and backward, the ventricular system was pushed to the left and there appeared to be a filling defect in the right ventricle, he also had pain in the back of the neck and head and incontinence of urine. As to location of the lesion, I do not believe it was frontal because the anterior horns were filled. It was not parietal because the reflexes were normal and there was no motor-system or pyramidal-tract involvement. He had no temporal lobe symptoms, such as astereognosis. We have no evidence of blindness (he did some driving on the way to Nova Scotia) so I presume it was not occipital. We have left, therefore, the region near the midline on the right side, as evidenced by the ventricles' being pushed to the left. It must be somewhat deep, and the regions which come under suspicion at this point are the corpus callosum, third ventricle, or the cortex above the corpus callosum and thalamus on the right.

He had an apparently fixed pupil when tested with direct light, but a good consensual reaction when the other eye was exposed to light. The

Argyll-Robertson pupil does not do that. It is fixed to both consensual and direct light. The only lesion that can cause a fixed left pupil with a normal light reflex from the right eye without other involvement of the sixth, fifth and third nerves would be a lesion in the right superior colliculus, that is near the posterior part of the corpus callosum, which is very close to the thalamus. In the differential diagnosis of this expanding lesion I should consider a tumor as most likely at this man's age. His symptoms were rapidly progressive, and a tumor in that region could easily result in such a clinical course. Secondly, I should think of cyst, and thirdly, abscess. Gumma and tuberculoma are fourth and fifth because of normal spinal fluid and negative Hinton and no evidence of tuberculosis elsewhere. To sum up, I should say he had a tumor in the region of the posterior part of the corpus callosum, either in it or above it, extending well to the right side of the midline.

DR. AUBREY O. HAMPTON. I cannot go farther than the report in the record. There seems to be a deep mass almost amputating the center of the body of the right lateral ventricle.

DR. TRACY B. MALLORY. The diagnosis that Dr. Schwab has made is approximately the same as that made on the ward.

DR. JAMES C. WHITE. My diagnosis was right-sided tumor, with the question of whether it involved the frontal or temporal lobe. His mental changes were more noticeable as you talked with him than one would realize from the history here. I believed it was rapidly growing because the symptoms were of such short duration, and the prognosis seemed to be very poor. I thought it was probably spongioblastoma multiforme.

DR. MALLORY. The operative findings were very much of a surprise. Perhaps Dr. White will tell us about them.

DR. WHITE. As soon as we had the bone flap turned down we could see bluish discoloration of the dura and it was obvious he had a hematoma. On opening the dura the hematoma appeared to cover the entire hemisphere and was a centimeter in thickness. There was a typical neomembrane surrounding the clot, and it was possible to dissect it out over the entire area.

DR. MALLORY. How often do you see a subdural hematoma in a case with no history of trauma?

DR. WHITE. We have seen several where we could not get a history. One patient I recall had bilateral subdural hematomas. He was an alcoholic and could give no accurate history.

DR. WILLIAM B. BREED. How is the patient now?

DR. WHITE. The patient died. It looked for a while as if he were going to recover consciousness. The afternoon after operation he was mumbling.

a little bit and making some movements, but next morning the coma was deeper. In spite of the ventricular shift we thought there might be a good-sized clot on the other side, as frequently happens, so I made a drill hole there but found nothing. The patient died four hours after that. In our experience patients who have had this degree of compression of the brain for a long period often die even though you remove the whole hematoma.

PREOPERATIVE DIAGNOSIS

Right frontal brain tumor

DR. SCHWAB'S DIAGNOSES

Brain tumor, right hemisphere over posterior part of corpus callosum?

Cyst in the same region?

ANATOMICAL DIAGNOSIS

Subdural hematoma, right

PATHOLOGICAL DISCUSSION

DR. CHARLES S. KUBIK: There was, so far as I can see, no good clue to the diagnosis. Since the specimen from this case reached us in fragmentary form after the surgical removal, let me demonstrate the lesion from another unoperated but essentially

similar case. The collection of blood, covering a large part of the lateral surface of the hemisphere, is enclosed between the dura on the outside and a thin, transparent, but fairly strong, fibrous membrane on the inside. The membrane arises entirely from the dura and is nowhere adherent to the underlying arachnoid. The hemorrhage, probably venous in origin, becomes surrounded by a membrane of newly formed connective tissue and, as the blood breaks down, the complex molecules likewise break down, the number of molecules increases and the material takes up fluid by osmosis. The encapsulated hematoma thus continues to increase in size and intracranial pressure rises. This is the brain from the case which was discussed and here are the remnants of the right-sided hematoma. There is flattening, though not very pronounced, of the convolutions of the left hemisphere and some displacement. Here, however, the third ventricle swings distinctly over to the left.

DR. SCHWAB: How do you explain the pupillary findings?

DR. KUBIK: I have no explanation for them.

A PHYSICIAN: Was there any evidence of vascular disease?

DR. KUBIK: No.

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AN OPPORTUNITY FOR THE DISTRICT MEDICAL SOCIETY

THE Medical Society of the County of Westchester, New York, has adopted a periodic medical examination for adults in contact with children. This examination, which is performed at a special rate, includes particularly physical examination, a chest x-ray and a Wassermann test. After each semiannual examination, a medical card is issued to those who have no serious physical handicaps and have been found free from evidence of communicable disease.

Teachers, nurses and domestic servants naturally constitute the group toward which the efforts of the medical society are directed, and parents are urged to co-operate by insisting that these individuals who are in contact with their children hold medical health cards. In this way a class of

"health certified servants" may be created whose services will be more desirable and hence will draw better wages. Both employer and employee will benefit by such a co-operative scheme, far more desirable than any attempt at instituting compulsory examinations.

Legislation at best can go only a short distance in prescribing personal health measures, case finding in communicable disease has always been accomplished by the practicing physician or by voluntary co-operation on the part of the patient. Ill-health and uncleanly habits in servants are unmeasured but very potent sources of danger. The organization of health services patterned after that of the Medical Society of the County of Westchester might logically be recommended to our various district societies.

A YEAR OF HEALTH

THE health of the citizens of Massachusetts during 1937, according to the report of Commissioner Henry D. Chadwick, was distinctly above par. It will go on the record as a "healthy" year, with no epidemic of any dangerous communicable disease, and a decrease in the morbidity of most of the other reportable illnesses.

Of forty communicable diseases, about 98,000 cases occurred in 1937 as against 106,115 in 1936, a decrease of nearly 8 per cent. Diseases which, within a few years, were dread names to conjure with, are now of little moment. Typhoid fever, for instance, which ran as high as 3452 cases in 1910, occurred in barely over 100 cases in 1937. Diphtheria, with 10,322 recorded cases in 1917, showed less than 300 in 1937, and smallpox has not occurred within the State since 1932. The death rate from tuberculosis has halved within a generation, 1937 producing only about 5200 cases with 1730 deaths.

The virulence of the streptococcus of scarlet fever has decreased so markedly in recent years that it is now necessary to go to Russia or Roumania to study the disease in its old form, and in general a similar experience seems to have been encountered

with other forms of infection caused by hemolytic streptococci

Health runs in cycles with recurrent epidemic years of the various infectious diseases, but over a long period of time many of the infections have decreased in severity and methods of immunization have been developed for others of them. The expectancy of life has steadily lengthened as the infectious diseases have lost in virulence or have come under control, and more and more prominently the degenerative diseases of middle and later years stand out as our principal causes of death

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 64 PREMATURE SEPARATION OF THE PLACENTA

Mrs L. D., a seventeen-year-old primipara, was admitted to the hospital in convulsions when she was approximately thirty-eight weeks pregnant. Three weeks before entry she consulted a doctor for the first time, and he had examined the urine and pronounced it negative. There was some edema of the ankles at that time but no other signs or symptoms of toxemia. Edema of the face developed during the week preceding entry. The patient went to bed at 10 p. m., May 26, apparently in good health. She awoke at 1 a. m. complaining of pains in the abdomen and she vomited. At 3 a. m. there was a generalized convulsion lasting several minutes. The patient had four more convulsions before entry to the hospital at 5 a. m. and she never regained consciousness. During the seizures she voided involuntarily and frothed at the mouth.

The family history was negative for tuberculosis, cancer or nervous disease. Her mother died of blood poisoning following a miscarriage. Her father was living and well.

The patient had always been well. She had measles in childhood. There was no history of scarlet fever, septic sore throat, rheumatic fever, diphtheria or typhoid. The systems were negative. Her menstrual history was not elicited.

Physical examination revealed a well-developed, slightly obese young woman in coma and with stertorous breathing. The face was edematous, particularly about the eyes. The skin was dusky. The eyes were normal except for dilated pupils. The heart was not enlarged, the rate was regular, the sounds were of good quality, and there were no murmurs. Blood pressure was 228 systolic, 130 diastolic. The chest was symmetrical, expansion was equal and normal, and the lungs were clear. The abdomen was enlarged to the size of an eight and one-half months' pregnancy. Labor pains were noted about every five to seven minutes. The fetal heart was not audible. There was marked edema of the feet and ankles.

Soon after entry the patient was given gas-oxygen anesthesia and was catheterized. The urine boiled solid with albumin and there were many hyaline and granular casts. She was given morphine gr $\frac{1}{4}$ subcutaneously, and 20 cc of 10 per cent magnesium sulfate intravenously. She had one convulsion fifteen minutes after entry and another ten minutes later. Slight twitching of the face was noted three hours after admission. She was then given 15 cc. of magnesium sulfate intravenously and 360 cc of blood was removed by venesection. The systolic blood pressure fell to 170. The pulse was 72. At 9 a. m., four hours after entry, vaginal bleeding appeared, the uterus became spastic and there were no intervals of relaxation. The pulse rose to 140 within thirty minutes. A diagnosis of premature separation of a normally implanted placenta was made and immediate preparation was undertaken for delivery by cesarian section.

Under gas-oxygen anesthesia a low classical cesarian was performed without difficulty. The baby was stillborn. The placenta was separated over approximately one-half of its surface, and there was a moderately large retroplacental clot. There was no free blood in the uterine cavity. The uterine musculature was not abnormal in either appearance or texture. Bleeding was not excessive and was controlled by the intramuscular injection of 0.5 cc of posterior pituitary extract. The patient's pulse was very weak at the conclusion of the delivery but improved markedly following a transfusion of 600 cc of citrated blood.

The pulse dropped to 90 following delivery and the patient's general condition seemed improved. Suddenly she developed Cheyne-Stokes respiration and irregularity of the pupils. There was a short convulsion at 2:40 p. m., and she died at 2:48 p. m. At no time following the operation had vaginal bleeding been excessive and there had been no signs suggestive of internal hemorrhage. It was felt that death could largely be attributed to eclampsia, and that the premature separation of the normally implanted placenta was an incidental occurrence.

which added to the shock and jeopardized the patient's chances for recovery but was not actually the cause of death

Postmortem examination showed enlargement of the liver to 2220 gm. The organ was smooth and irregularly mottled with dark-red and light-yellow spots. The kidneys were grossly normal, as were the uterus and the brain. Microscopic examination revealed small subendocardial hemorrhages of the heart, numerous extensive periportal and interlobular hemorrhages of the liver with resulting degeneration and absence of liver cells, and swelling of the glomerular tufts of the kidney. The adrenal, cerebrum, cerebellum, pituitary and uterus were all normal. The findings were those of eclampsia.

Comment. The prognosis was very unfavorable when this patient entered the hospital. The subsequent separation of the placenta made the prognosis even graver. The prenatal care of course was most inadequate. Her one visit to a physician three weeks before delivery showed nothing abnormal except edema. Had she been seen routinely, this edema might well have shown that the patient had put on a great deal too much weight and might have made one suspicious of an impending toxemia. It is perfectly possible that there were no other symptoms at this visit except the edema. Eclampsia occasionally may be as fulminating as in this case. The separation of the placenta, in this instance definitely due to the toxemia, added the element of hemorrhage to the serious eclampsia. The more conservative method now in vogue of rupturing the membranes, packing the cervix, and applying a Spanish windlass certainly would not have added the degree of shock which the abdominal section undoubtedly did, but it probably would have made no difference in the ultimate outcome.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning March 28

BARNSTABLE

Sunday, April 3, at 4 00 p m., at the Cape Cod Hospital, Hyannis. Subject: Some Complications of Labor. Analgesics in Labor. Instructor: Christopher J. Duncan. John I. B. Vail, *Chairman*.

BERKSHIRE

Thursday, March 31, at 4 30 p m., at the House of Mercy Hospital, Pittsfield. Subject: Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor: Oliver H. Stansfield. Melvin H. Walker, Jr., *Chairman*.

BRISTOL SOUTH (Fall River Section)

Monday, March 28, at 4 30 p m., at the Union Hospital, Fall River. Subject: Bleeding in the Last Trimester of Pregnancy. Instructor: Meinolf V. Kappius. Howard P. Sawyer and Robert H. Goodwin, *Chairmen*.

ESSEX NORTH

Friday, April 1, at 4 30 p m., at the Lawrence General Hospital, Lawrence. Subject: Bleeding in the Last Trimester of Pregnancy. Instructor: Judson A. Smith. John Parr, *Chairman*.

FRANKLIN

Wednesday, March 30, at 8 00 p m., at the Franklin County Hospital, Greenfield. Subject: Rheumatic Infection, Rheumatic Heart Disease. Instructor: Edward F. Bland. Halbert G. Stetson, *Chairman*.

HAMPDEN

Thursday, March 31, at 4 00 p m., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8 00 p m., in the Outpatient Department of the Skinner Clinic, Holyoke Hospital, Holyoke. Subject: Gonorrhea in the Male. Instructor: J. Dellinger Barney. George D. Henderson and George L. Schadt, *Chairmen*.

HAMPSHIRE

Wednesday, March 30, at 4 15 p m., in the Nurses Home, Cooley Dickinson Hospital, Northampton. Subject: The Use and Misuse of Prontylin. Instructor: Benjamin W. Carey, Jr. Warren P. Cordes, *Chairman*.

MIDDLESEX SOUTH

Wednesday, March 30, at 4 00 p m., at the Cambridge Municipal Hospital, Cambridge Street, Cambridge. Subject: Treatment of Burns. Instructor: Patrick J. Mahoney. Edmund H. Robbins, *Chairman*.

NORFOLK

Friday, April 1, at 8 30 p m., at the Norwood Hospital, Norwood. Subject: Drug Therapy in Pediatrics. Instructor: Warren R. Sisson. Hugo B. C. Ruemer, *Chairman*.

ESSEX NORTH DISTRICT MEDICAL SOCIETY

Attention of the members of the Essex North District Medical Society is called to the fact that the hour of assembly for postgraduate courses of the Massachusetts Medical Society being held in Lawrence this spring has been changed to 4 30 p m.

JOHN PARR, M.D., *Chairman*

DEATHS

ADAMS—DONALD STANSBURY ADAMS, M.D., of 27 West wood Drive, Worcester, died March 13. He was in his sixty-sixth year.

Born in Indianapolis, Indiana, he attended the schools in that city. He received his degree from the University of Virginia Department of Medicine in 1917 and interned at the University Hospital and the Boston City Hospital. During the war he served in the Medical Corps of the U. S. Army at Fort Devens. While there he met Dr. Homer Gage who persuaded him to go to Worcester, where he became resident surgeon at the Memorial Hos-

pital. He began private practice in 1923, but remained on the staff of the Memorial Hospital as assistant surgeon. He was, in addition, consulting surgeon at the Masonic Hospital, Shrewsbury, the Harrington Memorial Hospital, Southbridge, and the Webster District Hospital.

Dr Adams was a fellow of the American Medical Association and the Massachusetts Medical Society. Among his affiliations were memberships in the American College of Surgeons and the New England Surgical Society. He was a major in the Medical Reserve Corps.

His mother survives him.

CRANDELL—ARTHUR RICHMOND CRANDELL, M.D., died at his home, 48 Church Green, Taunton, March 19. He was in his sixty-ninth year.

A native of Taunton he attended the high school there, later graduated from Harvard University and received his degree from Harvard Medical School in 1896. Dr Crandell was a fellow of the American Medical Association and the Massachusetts Medical Society. His memberships included the New England Pediatric Society, the Taunton Doctors Club, the Harvard Clubs of Boston and Taunton, and the Old Colony Historical Society. Since 1900 he had been consulting physician at the Morton Hospital in Taunton.

His widow, a daughter, a sister and three grandchildren survive him.

NEW HAMPSHIRE MEDICAL SOCIETY

HISTORICAL NOTES

The New Hampshire Medical Society was incorporated by a legislative act signed on February 16, 1791. Dr Josiah Bartlett, president of the Senate, was one of the nineteen charter members who met at Exeter the following May for formal organization. Dr Bartlett, senior member of a family which has furnished five active officers and fellows to the society, was later president, and while governor of the State, refused a re-election. In his letter declining further honors he expressed the hope that the new society would "produce effects greatly beneficial to the community, by encouraging genius and learning in the medical science and discouraging ignorant and bold pretenders from practicing an art of which they had no knowledge." He set forth the aims of the society in the promotion "of better regulations than it had, and expressed the wish that "the practice of medicine in the State (upon which the lives and healths of our fellow citizens depend) might be under better regulation than in times past. John Rogers, of Plymouth, attended this meeting coming on horseback, a journey more laborious and time-consuming than would be necessary for a trip to the West Coast today.

David Ramsay, early pioneer physician, wrote one of the first and best histories of the Revolutionary War. It is still accepted as a classic.

The preceptor system prevailed in the State for many years. Medical schools then required that each attendant on a course of lectures be registered with a practitioner. It is reported that one popular physician in Portsmouth had twenty students at a time. When Dr Willard Parker left New Hampshire on his lecture tour from school to school, as he did for a considerable period each year, pupils followed him. Dr Frank Foster, of New York, in a short sketch of the career of Dr Charles Gage, of Concord, a leading surgeon for many years, states that Dr Gage always had many students, and that he himself studied with him for five years before venturing to attend a medical school.

It is interesting to note the frequency with which men, even in the very early days of New Hampshire, traveled and studied in foreign medical schools, both before and after graduation. Records show many instances of tremendous sacrifice involved in an absence from practice of many months, resembling the career of John Y. Bassett, of Huntsville, Alabama. The Alabama Student, immortalized by Osler in one of his finest essays.

Two New Hampshire members of the Continental Congress were Drs. Matthew Thornton and Josiah Bartlett, both signers of the Declaration of Independence. Bartlett was the first member to vote in favor of it, and at the signing of the document his name appears immediately after John Hancock, the president. "He had many times taken the responsibility for the birth of a man. Why should he shrink at the birth of a nation?" Dr Thornton and Dr Bartlett, like Benjamin Rush, of Pennsylvania, were young men, who showed the fiber of which they were made in their subsequent careers in medicine and in public service.

In its first century the New Hampshire Medical Society received seven hundred and twenty-four men into membership. The membership numbered two hundred and forty-five at the centennial exercises in 1891, and it was reported that honorary membership had been conferred on seventy physicians.

Conservative New Hampshire was slow in admitting women physicians to membership. By her association with the Manchester Medical Association, Dr Mary Danforth became a member of the Society in 1877. Dr Julia Wallace Russell, of Concord, in June, 1878, was voted the first woman member through action of the Council.

Following the vote of the Society in 1838 regarding the desirability of a national convention, the Medical Society of the State of New York recommended that the first meeting be held at Philadelphia in May, 1840. In 1839, at Smith's Tavern in Salisbury, Luke Howe, Thomas P. Hill and Thomas Chadbourne were chosen as delegates to the Philadelphia convention.

Dr William E. Maloney, of Keene, showed before the Cheshire County Medical Society in 1894 a patient on whom he had performed a cholecystectomy a few weeks before. This is undoubtedly the first removal of the gall bladder ever done in the State.

Adhesive plaster traction in the treatment of fracture of the femur originated with Josiah Crosby, of Manchester, who was of the family that gave many eminent medical men to this State. In 1849 an engineer, building a bridge over the Merrimack for the New Hampshire Central Railroad, suffered a fracture of the upper third of the bone. Dr Crosby applied, as was then customary, a long splint with a garter for extension and perineal band for counterextension. The patient bitterly complained of the pull of the garter about the ankle and instep. At his first removal from the bed the fragments parted, and the patient was informed that the apparatus must again be applied. Rebellion followed, and the doctor was urged to consider some less painful method of treatment. Long straps of adhesive plaster were applied to the sides of the leg, contact assured by snug bandages, and a weight attached. The fracture united and the patient lived many years. To distinguish Dr Crosby from a nephew of the same name he was ever after known as "Sticking Plaster Crosby." A writer in the *Philadelphia Medical Examiner* in 1852 attempted to claim priority for the discovery, but the writer's contentions were never accepted.

The income of physicians of the past is always of inter-

est to us moderns. A leading physician of our most wealthy city is reputed to have received no more than five thousand dollars per year in his most productive period, the late 1870s. He was paid seventy five cents per visit, a dollar and half for night visits, and a five-dollar obstetrical fee, one had to be industrious. A receipted bill of 1829 recently came to light with charges of "twenty cents for calling in and emetic and 'two dollars fifty cents for facilitating the birth of a child.' Yet not a few were able to leave modest competencies for their families.

At the meeting of the Society in 1894, Cyrus Kelley, in a paper "Then and Now," stated that the only instrument of diagnosis he owned in the early days of practice, aside from a crude clinical thermometer, was a stethoscope of cardboard, rolled into the shape of a cone, the base being applied to the chest and the apex to the ear. Laennec had just reported his observations on transmission of sound from the chest, but the wooden stethoscope had not then been offered. Even percussion came later.

Agitation for state licensure began as early as 1890, but the efforts of the organized profession were nullified by sectarian groups and reluctant legislators. The year 1897 marked the enactment of the first comprehensive statute for adequate protection of the public, and this statute has required very little amendment to the present. From July, 1897, when the law became operative, to 1938 over twenty-one hundred licenses have been granted. An average of about five hundred physicians have been in active practice each year.

At the 1895 session of the Society, following a discussion of the treatment of diphtheria, Dr. O. B. Douglas, of New York City, a prominent laryngologist, is quoted as saying "I do not believe that anti-toxine has come to stay. Professor Winters recently gave us [at the New York Academy of Medicine] an *expose* of its use at Wilford Parker Hospital. It seemed to do more harm than good."

Probably no other New Hampshire physician had, or ever can have, the unique distinction of Nathan Smith. A pupil of a prominent Vermont surgeon for a short time, he started a practice at Cornish, but two years later, realizing his incompetence, he registered at Harvard and received the degree of M.B. in 1790. He studied abroad returning six years later when he was honored by the degree of A.M. by Dartmouth College, and was elected to the Chair of Anatomy, Surgery, Chemistry, Materia Medica, and Theory and Practice in the medical school he was opening. In one room in Dartmouth Hall—laboratory, lecture room, library and dissecting room—he taught for four years. In 1811 Yale called him to New Haven to inaugurate the medical department. In 1821 he organized the medical school at Bowdoin College, giving all the lectures for two years, except those on chemistry and anatomy. Though he continued his lectures at Yale from 1813, he managed to hold a professorship in surgery and medicine at the University of Vermont. To him more than to any other man, it is believed, may be ascribed the advantages for medical education in America at this date [1891].

CANCER COMMITTEE

BIOPSIES

The most accurate method for the diagnosis of cancer is the microscopic examination of a portion of the tumor in the hands of an expert pathologist.

Details for performing biopsies vary with the individual situation, some are performed with the scalpel, others

with the electric knife, some by one or other of several punches which are on the market, and some by curet tage. *In any case a living and not a necrotic part must be removed, preferably with a bit of the surrounding tissue.* Merely clipping off of the surface of a tumor is not adequate.

The best fixative is 10 per cent formalin solution. The tissue should be immediately placed in a volume about ten times as great as the mass of tissue removed.

Biopsy is of value in following the course of treatment, —sometimes of critical value, —and *if properly done it is harmless.* Details of the history are of importance to the pathologist in all cases and should always be sent with the specimen. This is particularly important in those in which physiological activities are likely to be superimposed in and around tumors, such as menstrual hyperplasias in carcinoma of the uterus.

Occasionally a clinical diagnosis of cancer is not sustained by the microscopic picture, whereupon a *consultation with the pathologist is imperative.*

Biopsies are harmless if done properly, they usually settle the diagnosis, but pieces of tissues must be properly chosen for this purpose. They are also necessary in many cases to follow the course of treatment. The pathologist can be depended upon to use methods of preparation of his materials to ensure the quickest reports consistent with the accuracy demanded.

There is more danger from massage or repeated manipulation in making examinations, especially in cancer of the breast than in doing a biopsy.

HOWARD N. KINGSFORD, M.D.,
Committee on Control of Cancer

PNEUMONIA SERVICE

Dr. Travis Burroughs, secretary of the New Hampshire Board of Health, has issued detailed information regarding the pneumonia service. Complete instructions for typing sputum and for obtaining serum will be furnished on application. Arrangements have been made for designation of hospitals and laboratories for typing in various parts of the State, and, as rapidly as possible, more technicians will be trained for this work. The plans of the secretary include as complete a service as is offered by any other state. Only technicians with proper training and a high standard of performance will be offered the special course, so that a uniform and efficient service will be obtained, without waste of effort and money.

COMMONWEALTH FUND FELLOWSHIPS

Announcement is made by the Committee on Medical Education and Hospitals that Commonwealth Fund fellowships are available, for members of the Society, in medicine, pediatrics, obstetrics and office surgery. Fellows must be graduates of Class "A" medical schools, residents of communities of less than ten thousand population and must have been in practice at least five years. A generous stipend is allowed for expenses, and tuition is paid by the Fund. Application blanks may be obtained from P. O. Box 48, Hanover, N. H. Dr. Samuel T. Ladd, president of the Society, has endorsed this plan, and urges eligible physicians to make application.

SOCIETY NEWS

Dr. Sven Gundersen, of Hanover, read a paper on "Serum Treatment of Pneumonia" at a meeting of the Carroll County Medical Society at Conway on February 20.

Dr. Edna Walck, the first woman member to be honored with the presidency of the Dover Medical Society,

was in the chair for the regular meeting on March 2, when Dr. George Cumming, of Portland, gave a clinical talk on "Nose and Sinuses." This society is one of the oldest city associations in the country with continuous existence, having been organized in 1849.

Frank Sulloway, Esq., legal adviser of the Society, was the speaker at the February meeting of the Dover Medical Society. His subject was "Medical Liability."

BIRTH

On February 27, to Dr. and Mrs. Samuel J. King, of Farmington, a son, Robert Bruce.

PERSONALS

Dr. Roscoe Blanchard, of Dover, has recovered from a recent illness and has resumed his practice.

Dr. Peter F. Doyle has been elected city physician of Dover for the term 1938-39.

Dr. Nathan Milliken, of Hanover, has been elected an associate of the American College of Physicians.

Dr. Ralph Miller, of Dartmouth Medical School, was a delegate to the recent meeting of the Council on Medical Education and Hospitals at Chicago.

Dr. Montfort Haslam, formerly resident physician at St. Paul's School, Concord, opened an office at 18 Church Street, Littleton, on March 1. Dr. Haslam has been for the past year in New York City, where he has taken postgraduate work at the Post-Graduate Hospital, Willard Parker Hospital and Margaret Hague Maternity Hospital.

Dr. George S. Foster, Manchester, is the donor of the Mt. Washington Marathon Trophy now on display at the New Hampshire Historical Society. The large silver cup already bears the names of two winners who have made the ascent of the mountain in less than one hour and twenty minutes.

NOTES

Representative Charles P. Tobey has introduced a bill in the House of Representatives carrying an appropriation for the establishment of a veterans' administration general hospital in the southern part of New Hampshire.

Announcement has been made by the Manchester Council of Social Agencies concerning the recent formation in that city of a permanent social hygiene committee, with Dr. Harry W. N. Bennett as chairman. This committee is to be expanded to include both professional and lay people and will confine its activities mostly to maintaining a speakers' bureau and literature in the field of social hygiene.

Dr. Ralph Jones gave an address on "The Influence of Medicine on History" for the Whitefield Rotary Club on February 19.

The trustees of the Wentworth Hospital, Dover, announce the appointment of Miss M. A. Hall as superintendent, and the reorganization of the nursing and administrative staff.

Dr. Robert B. Kerr, executive secretary of the New Hampshire Tuberculosis Association, announced in his annual report that there are 6223 active arrested and contact cases of pulmonary tuberculosis in the State. New Hampshire with a death rate of 33.7 per 100,000 has the lowest rate in New England, and is eighth lowest in the continental United States. Since the association was organized, deaths per year have decreased from 500 to 172.

Dr. Warren Phillips, of Boston, was the speaker at a meeting of the Wolfeboro Rotary Club on February 15. His subject was "What the Layman Should Know of Syphilis." The Tufts College Medical School talking film "The Training of the Doctor" was shown.

Under the direction of Mrs. Harry W. Smith, of Durham, the annual drive for enrollment in the Women's Field Army will be held during the month of April. The State has been divided into districts roughly corresponding to the location of the clinics of the State Cancer Commission. Physician and nurse speakers will address groups of both men and women.

The income of a trust, created by the will of Volna K. Kelton, of Grafton Center, is used for the payment of a bonus to the local physician. Dr. Walter D. Berry has been retained to provide medical service for a group of towns among which are Grafton, Danbury, Orange, and Springfield.

DEATHS

LEETE—GEORGE E. LEETE, M.D., who had practiced medicine in Concord for the past forty-four years, died at his home, Tuesday, February 22. He was in his eighty-seventh year.

Dr. Leete was born in Claremont, New Hampshire, March 29, 1851, the son of George H. and Sarah F. (Chase) Leete, his ancestors were among the first to settle in Connecticut and later moved to New Hampshire.

He graduated from the Dartmouth Medical School in 1878, after which he established a practice in Canaan where he remained for seventeen years.

In Canaan, Dr. Leete was a member of the School Board in 1893 and of the Board of Health in 1894. The remainder of his life was spent in Concord. The New Hampshire Medical Society gave him its gold medal for fifty years of medical practice in 1934.

On February 14, 1878, he married Katherine S. Sawyer, now deceased. One son, Dr. Edward Don Leete, of Boston, survives him. A second son, George Paul Leete, died.

Dr. Leete was a member of the New Hampshire Medical Society and the American Medical Association. He was also an honorary member of the Jefferson College Alumni Association at Philadelphia.

LOBDELL—ALBAN J. LOBDELL, M.D., died March 5 in Keene after a short illness. Dr. Lobdell had been one of Winchester's most prominent residents since opening his office in 1893. He was interested in community affairs and had served as president of the Board of Trustees of the Winchester Library and as a member of the Board of Health for several years.

Dr. Lobdell was born in East Berne, New York, April 2, 1868, a son of Adoniran J. and Eleanor (Veeder) Lobdell. He started teaching school when eighteen years old and at the same time was studying medicine. He graduated from the New York Homeopathic Medical College in 1893.

He was a member of the New Hampshire Medical Society, the Cheshire County Medical Society and the American Institute of Homeopathy.

On November 25, 1896, he married Miss M. Grace Ball, of Winchester, who survives him. He is also survived by two sons, Alban J. Lobdell, Jr., of Woburn, Massachusetts, and Winston B. Lobdell of Stoneham, Massachusetts, a brother, Rev. Isaac Lobdell, pastor of the Universalist Church in Attleboro, Massachusetts, and two grandchildren.

MISCELLANY

RÉSUMÉ OF COMMUNICABLE DISEASES
IN MASSACHUSETTS FOR FEBRUARY, 1938

DISEASES	FEBRUARY 1938	FEBRUARY 1937	FIVE YEAR AVERAGE*
Anterior poliomyelitis	0	0	1
Chickenpox	1608	1438	1225
Diphtheria	11	17	41
Dog bite	525	572	451
German measles	80	77	503
Gonorrhea	445	429	406
Lobar pneumonia	519	964	651
Measles	811	3502	3539
Meningococcus meningitis	9	15	9
Mumps	777	735	889
Paratyphoid B	1	2	0
Scarlet fever	1213	1002	1058
Syphilis	461	509	401
Tuberculosis pulmonary	195	252	235
Tuberculosis other forms	23	21	30
Typhoid fever	5	3	5
Undulant fever	3	1	2
Whooping cough	454	1831	993

*Based on figures for preceding five years

RARE DISEASES

Diphtheria was reported from Boston, 2, Fall River, 2, New Bedford, 1, Swampscott, 1, Taunton, 5, total, 11

Dysentery, bacillary, was reported from Boston, 2, Brookline, 1, Greenfield, 1, Peabody, 1, Worcester, 1, total, 6

Meningococcus meningitis was reported from Boston, 2, Cambridge, 1, Chicopee, 1, Holyoke, 1, Tewksbury, 1, Waltham, 1, Westfield, 1, Worcester, 1, total, 9

Paratyphoid B was reported from Belmont, 1

Pfeiffer bacillus meningitis was reported from Attleboro, 1

Septic sore throat was reported from Beverly, 2, Boston, 5, Brookline, 1, Cambridge, 1, Chicopee, 1, Lawrence, 1, Medford, 1, Melrose, 1, Northfield, 5, Quincy, 1, Springfield, 1, Winthrop, 1, total, 21

Trichinosis was reported from Boston, 3, Springfield, 1, total, 4

Typhoid fever was reported from Boston, 1, Chelmsford, 1, Haverhill, 1, Quincy, 1, Westfield, 1, total, 5

Undulant fever was reported from Chicopee, 1, Natick, 1, Pittsfield, 1, total, 3

The incidence of diphtheria showed record low figures for the second consecutive month.

German measles, mumps and tuberculosis (other forms) were reported below the five year average.

Chickenpox for the second consecutive month showed record high incidence.

The incidences of scarlet fever and undulant fever were above the five year average.

The incidences of meningococcus meningitis and typhoid fever were not remarkable.

Lobar pneumonia, whooping cough, measles and pulmonary tuberculosis were reported at figures considerably below the five year average

The reported cases of animal rabies gave evidence of wide distribution throughout the State. New foci were reported in Boxford, Chelsea and Sutton. Previously noted foci in the North Metropolitan area and in Wilmington were active

TUBERCULOSIS ABSTRACTS

THE EFFECT OF CONTAGIOUS DISEASES ON TUBERCULOSIS

An attack of acute contagious disease in a child infected with the tubercle bacillus is something nearly every physi-

cian dreads. It has long been taught that measles, whooping cough and influenza predispose to tuberculosis and aggravate existing clinical tuberculosis. It is also commonly said that the acute contagious diseases, particularly measles, depress or obliterate the child's capacity to react to tuberculin. These opinions, seldom supported by convincing facts, have recently been challenged. J P Nalbant in a paper entitled "The Effect of Contagious Diseases on Pulmonary Tuberculosis and on the Tuberculin Reaction in Children" (*Am Rev Tuberc* 36 773-777, 1937), reports on a study made of 118 children convalescing from tuberculosis who developed acute contagious diseases while in the sanatorium. Excerpts from his paper follow

Several writers state that during an attack of measles the tuberculin test becomes negative. Some assert that intercurrent infections, particularly measles, stimulate activity in many cases of tuberculosis. In one series of 37 cases of tuberculous children who developed measles, the tuberculin test done by the Pirquet method showed that the reaction became negative in all at the appearance of the eruption, but became positive again in half of them by the seventh day. Other writers express different views. Chadwick, for example, found that a group of tuberculous children who reacted positively to tuberculin showed no change roentgenologically and no change in their tuberculin reactions during and after measles. Berghoff studied 596 cases of measles in the army and found only 1 case of frank active tuberculosis following directly after a measles infection.

Scattered studies made in Europe to determine the effect of whooping cough, chickenpox, scarlet fever and measles on the tuberculin reaction, and on active or inactive tuberculous lesions, indicate that the effect of the contagious diseases on tuberculosis has been exaggerated and may be very doubtful. This supports the findings of the author in a study made at the William H. Maybury Sanatorium, which included 43 children with measles, 39 with chickenpox, 16 with whooping cough, 13 with scarlet fever, 30 with mumps and 6 with diphtheria, making a total of 147 cases of acute infectious disease in a group of 118 children convalescing from pulmonary tuberculosis of the childhood type. The ages of the children ranged from six months to fifteen years. All had x ray examinations of the chest a short time before the onset of the contagious disease and directly after the expiration of the quarantine period. Eighty three of the 118 children had active pulmonary tuberculosis of the childhood type, the remaining 35 had quiescent or apparently arrested disease.

In 4 of the 43 cases of measles the intracutaneous tuberculin test with old tuberculin became negative to a dose to which they were positive before, but was again positive two weeks after the disappearance of the eruption. Six cases showed, by roentgenological examination, an increase in the pre-existing tuberculous process but none of these occurred in less than one month after the measles. In each instance the exacerbation of the tuberculosis was an evanescent occurrence and all recovered completely in a few months.

Two of the 16 children with whooping cough showed exacerbation of the tuberculous disease. In 1 case this occurred during the course of whooping cough but subsided promptly. Three of the cases of chickenpox experienced extensions of their tuberculous lesions none of them showed any change in the tuberculin reaction. Of the 25 children with mumps, 24 were positive to tuberculin before and after the disease. However, a change in the type of the reaction was noticed in several. None of the

mumps patients showed reactivation or exacerbation of their tuberculosis

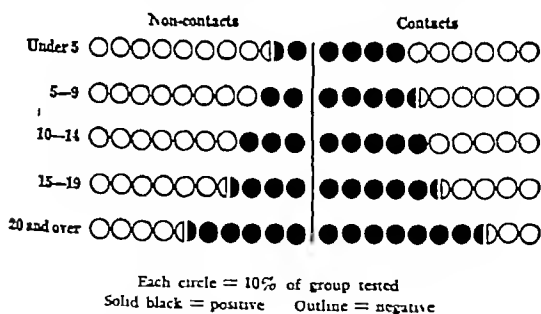
Of the 13 cases with scarlet fever, only 1 showed a spread of the tuberculous process. None of the 6 cases of diphtheria experienced any ill effects so far as their tuberculosis was concerned. The children with scarlet fever and diphtheria were not tested with tuberculin.

In the discussion, the author points out that only 12 children of the 118 showed any increase in the tuberculous lesions during convalescence. This closely parallels the experience of similar groups of patients whose tuberculosis was not complicated by acute contagious diseases. In the great majority of those who showed increase in tuberculosis, the extension occurred several weeks after the intercurrent disease had subsided. None of these remissions occurred in quiescent or apparently arrested lesions showing that the old foci were not disturbed by the intercurrent contagious disease. The remissions seen in the active tuberculous lesions could be safely considered coincidental and unrelated to the contagious disease.

Very little evidence was found to support the contention that measles or any of the other contagious infections have a depressing effect on the body's capacity to react to tuberculin. In the majority of previous studies the Pirquet method was employed for giving the tuberculin test. This may explain the apparent discrepancy, because the Mantoux test, which is more precise, was used in all of the author's cases.

RESULTS OF TUBERCULIN TESTS

Tuberculin reaction studies made with purified protein derivative in various parts of the country were collated by the Statistical Service of the National Tuberculosis Association. The graph, based on 56,638 tests, pictures the



steady increase in the percentage of reactors with increasing age. It contrasts also the far greater percentage of reactors among contacts as compared with those among non-contacts.—*Tuberculosis Abstracts* March, 1938

CORRESPONDENCE

FELLOWSHIP IN DIABETIC LABORATORY WORK

To the Editor A fellowship in diabetic laboratory work for technicians working in other hospitals or in doctors' offices has been created at the New England Deaconess Hospital for the remainder of this year or perhaps longer if it meets a need. Often a graduate technician may require simply a few days instruction, rarely over one or two weeks.

It has been reported to me that our visiting doctors are often interested particularly in rapid methods for quantitating sugar in the urine, in capillary blood sugar tests for children and in various measures by which costs are reduced.

The technician will be expected to secure rooming accommodations, but meals will be provided by the hospital and there will be no charge for instruction

Should a technician care to apply for this fellowship, the application should be accompanied by a letter, addressed to me, from the superintendent of the hospital or doctor by whom he or she is employed.

WARREN F COOK, *Superintendent.*

New England Deaconess Hospital,
Deaconess Road,
Boston, Massachusetts.

INTERCITY HEALTH-CONSERVATION CONTEST

To the Editor To the medical profession of Boston, the Boston Health Department expresses its gratitude for the co-operation received from the doctors who gave so generously of their time to compile and place at the disposal of the department data upon immunizations and other public health measures performed by them for their private patients during the year 1937

This material was used in the recently completed Intercity Health-Conservation Contest. These contests, sponsored by the United States Chamber of Commerce and the American Public Health Association, have been going on for a number of years. This is, however, the first time that Boston has entered the contest, and the decision to do so was arrived at upon rather short notice and late in the day. Hence, the sudden call upon individual doctors and organized agencies for the necessary data.

The response from private physicians to our request was most gratifying, both as to the number of doctors taking the trouble to answer the appeal and also the volume of what may be classified as public health or preventive functions, privately performed. For instance, 3328 Boston children were immunized against diphtheria, 6390 children were vaccinated against smallpox, 3000 infants and 1800 preschool children were periodically examined for the purpose of keeping the children well and over 19,000 prenatal visits were made in the private practices of about 25 per cent of the members of the Massachusetts Medical Society with offices in Boston.

This department also thanks all official and voluntary agencies engaged in public health work which contributed information upon numbers and kinds of public health functions performed by these agencies during the year 1937, as well as the Committee of Citizens acting for the local Chamber of Commerce, whose members aided in the fact findings necessary for the required purposes of the contest.

H. F. R. WATTS, M.D.,
Health Commissioner

City Hall Annex,
Boston, Massachusetts.

REPORTS OF MEETINGS

NEW ENGLAND HEART ASSOCIATION

The regular monthly meeting of the New England Heart Association was held at the Boston City Hospital on December 13, 1937. The following program was presented

TWO UNUSUAL CASES OF DISSECTING ANEURYSM OF THE AORTA. Soma Weiss, M.D.

Two cases of dissecting aneurysm of the aorta were presented, demonstrating (a) dissection causing compression of the coronary artery and cardiac infarction and (b)

simultaneous presence of syphilis and dissecting aneurysm. Both are reported in detail in this issue of the *Journal*

THE CARDIOVASCULAR EFFECTS OF INTRAVENOUS INJECTIONS OF FIFTY PER CENT DEXTROSE AND SUCROSE IN NORMAL PERSONS AND IN PATIENTS WITH HEART FAILURE
Laurence B Ellis, M.D

An investigation was made of the effect on the circulation of the intravenous injection of 100 cc. of 50 per cent glucose or sucrose solutions. Studies were made on 27 subjects. These fall into three general groups. The first comprises 6 subjects with normal cardiovascular systems. The second consists of 10 cardiac patients without edema, including 2 who had recently had severe coronary occlusions, 2 who had never experienced heart failure, 3 who had recently recovered from congestive failure and 3 who were in definite failure without peripheral edema. The third group of 11 cardiac patients all had severe congestive failure with edema which varied in degree from moderate to massive. The cardiovascular effects of the intravenous injection of dextrose or sucrose solutions are similar. There was no significant change in the arterial blood pressure or in the heart rate. The venous pressure tended to rise during the course of the injection, and this increase was as much as 7 cm of water. In most instances it fell progressively after the injection had stopped. The plasma volume was increased at the end of a half hour on an average of 9 to 12 per cent, or about 300 cc., and in some instances by as much as 20 per cent, or 600 cc. This increase in plasma volume is due to the drawing of fluid from the tissue spaces to the blood stream by the hypertonic action of the sugar introduced. The dilution of the plasma was temporary and had usually disappeared at the end of one hour. No significant differences in the response of the circulation could be detected which depended on the degrees of heart failure.

FRIEDLANDER'S BACILLUS PERICARDITIS. James M. Faulkner, M.D

A man of forty-nine, who was a heroin addict and an alcoholic, entered the hospital with a history characteristic of the onset of pneumonia three days before. On admission, he presented signs of consolidation at the base of the right lung, fever, prostration and leukocytosis. The sputum contained many large, gram negative rods, and on culture Friedländer's bacilli were the predominant organisms. The same bacterium was recovered from the blood culture on the day of admission, and subsequently from pleural exudate on both sides. For four weeks there was gradual clinical improvement with subsidence of fever and leukocytosis. The pulse rate remained elevated, however, and the electrocardiogram showed pronounced changes in the T wave. Orthopnea, increased venous pressure, enlargement of the liver, and general anasarca developed. Finally, rales appeared in the lungs and he died suddenly sixty days after admission.

Postmortem examination revealed, in addition to areas of bronchopneumonia with marked fibroblastic proliferation in the lung and pleura, a very much thickened and adherent pericardium, which cut with difficulty. There was 300 cc. of purulent exudate in the pericardial cavity. Microscopically, the pericardium consisted of fibroblasts diffusely infiltrated with lymphocytes and macrophages. The histologic appearance of the pericardium was consistent with a lesion of less than nine weeks duration.

The case illustrates an unusual form of acute pericarditis which went on to the obstructive form of adherent pericardium in a relatively short period of time.

THE MYOCARDIUM IN FATAL CASES OF HEMOLYTIC STREPTOCOCCUS INFECTIONS. G. Kenneth Mallory, M.D., and Chester S. Keefer, M.D.

The sections of myocardium from cases dying from scarlet fever, erysipelas, streptococcus sore throat and surgical *Streptococcus hemolyticus* sepsis were studied, and the changes found were illustrated by lantern slides. These changes consisted of focal accumulations of lymphocytes, plasma cells and histiocytes beneath the endocardium, in the perivascular areas and between the muscle fibers. In several more acute cases, organisms (cocci) without reaction or organisms with an acute reaction of polymorphonuclear leukocytes were found. These lesions had the same distribution as those already described. Similar reactions, both acute and chronic, were found in other organs, particularly the kidney, liver, pancreas and adrenal.

These changes were found in 61 per cent of the hearts examined. The lesions were similar and equally common in all age groups. They were commonest and most marked in patients dying from six to ten days after the onset of the infection, but were found as late as the thirtieth day. The majority of the cases had a positive blood culture for *Streptococcus hemolyticus* at the time of autopsy.

In conclusion, it was stated that the lesions described may be infectious in origin and the result of the reaction of the tissues to the presence of invading organisms and not, as other workers have suggested, a reaction to a circulating bacterial toxin. It was felt, however, that the degree of this reaction may be somewhat enhanced as a result of antigen antibody response.

INFARCTION OF THE HEART. A MORPHOLOGICAL AND CLINICAL APPRAISAL OF 300 CASES. William B. Bean, M.D. (presented by Paul Kunkel, M.D.)

A detailed study of 300 autopsied cases of cardiac infarction at the Boston City Hospital was made. The material was discussed under three titles: (1) predisposing and precipitating conditions, (2) clinical and morphological observations, (3) clinical course and morphological findings.

All possible correlations of the assembled data on these cases were made. These included distribution by decades, which showed that initial infarction in both men and women was highest in the seventh decade. Initial infarction in hypertensives was higher in the sixth and seventh decades, as compared with the whole group, as was also the case in those with family history of vascular disease. There was a low incidence of initial attacks and deaths during the summer months. A study of the occurrence of various types of arteriosclerosis showed that the overwhelming majority of cases presented coronary artery disease, and that 20 per cent of the infarcts followed arterial narrowing without thrombosis. The importance of surgical and medical shock was stressed as an occasional precipitating factor. A third of all cases presented pre-existing cardiac failure, and in this series dyspnea and edema did not protect from anginal pain. Alcohol and tobacco seemed to play an unimportant role, excepting perhaps alcoholic coma. Other correlations included coexisting diseased states, of which diabetes mellitus and gallbladder disease were conspicuous. An analysis of circumstances at onset of infarction indicated that time of day, occupation and activity were unimportant factors. The majority of patients died of congestive failure.

THE EFFECT OF EPINEPHRIN AND PITRESSIN IN SODIUM-NITRITE COLLAPSE. Eugene A. Stead, Jr., M.D., and Paul Kunkel, M.D.

Epinephrin and Pitressin are drugs which are frequently used in the treatment of collapse and shock. Since controlled observations are difficult to make in patients who are critically ill, it was necessary to find a type of collapse which would reproduce the circulatory changes observed in clinical shock and which could be produced at will. Sodium nitrite in the upright position produces the manifestations of collapse ending in syncope by increasing the venous distensibility with resulting pooling of the blood in the lower part of the body. The arterioles are constricted but tissue anoxia results as the venous return to the heart decreases. (See Wilkins, R. W., Weiss, S., and Haynes, F. W. *J. Clin. Investigation* 17: 41-51, 1938.)

Epinephrin and Pitressin are not effective in preventing sodium nitrite collapse. In fact, they tend to precipitate it. They do not cause enough constriction of the venules to overcome the pooling of blood in the dependent portions of the body, but do produce marked arteriolar constriction and a decrease in blood flow as measured in the hands. This increases tissue anoxia and heightens the collapse. The fact that with epinephrin and nitrite the symptoms of collapse often occur with the blood pressure at higher levels than with nitrite alone indicates that the level of arterial pressure is not a sure guide to the condition of the patient.

REPAIR IN CORONARY SCLEROSIS. Timothy Leary, M.D.

From a study of 200 advanced lesions in 120 cases of coronary disease it became evident that every advanced atherosclerotic lesion is vascularized. On the contrary, the early lesions are not vascularized. Nutrition of the normal intima is by diffusion of material from the blood in the lumen. This diffusion is adequate to care for the nutrition of early atherosclerotic lesions as well. When a lesion enlarges to the point at which diffusion nutrition ceases to be adequate, necrosis occurs. If the lesion is to enlarge beyond this point, a new source of nutrition, that is, by vascularization, is necessary. Vascularization in young individuals frequently arises directly from the lumen, in the form of a capillary circulation which does not tend to differentiate further. The persistence of this central, capillary circulation well into the middle period of life in many cases suggests that it may lengthen life, perhaps by ensuring nutrition to the portion of the lesion most exposed to injury that may result in thrombosis. In older persons vascularization arises from the vasa vasorum, and differentiation into arteries and veins usually occurs as the lesions age. Hemorrhage in coronary lesions originates from these new vessels, and is usually terminal. Since it arises from vessels which are produced in the repair of well-established and enlarging, atherosclerotic lesions, hemorrhage cannot be the source or cause of atherosclerosis. Repair of thrombosed vessels by canalization may in rare cases re-establish in considerable degree the crippled, local circulation.

THE CONGRESS ON MEDICAL EDUCATION

The Thirty Fourth Annual Congress on Medical Education and Licensure was held in Chicago on February 14 and 15 of this year and while little new was presented, there was renewed emphasis on one of the principles of medicine which was dwelt on last year, namely, that the quality of the person who renders medical service is of prime importance. From time to time the emphasis has shifted premedical education, the medical curriculum,

the faculty, the mechanics of education as it concerns plant and equipment, whether in the school itself or in the hospital, and finally the person to be educated.

The opening address was by the chairman of the Council on Medical Education and Hospitals, Dr. Ray L. Wilbur, of Stanford University, who began with a reference to the recently completed study of medical schools in the United States, the results of which have not yet been made public. Many deficiencies have been found, but it has been thought wise to refrain from giving publicity to the parts of the report showing such deficiencies before the schools themselves have been given opportunity to make good. In general the schools have shown great willingness to follow the recommendations of the Council. Uniformity in method or procedure or curriculum has not been sought, but an effort has been made to set forth a reasonable minimum for each school, taking into consideration all the resources of the school, and most important of all, what may be expected of every physician who holds himself out as qualified to treat the sick. Both tangibles and intangibles must be considered. It is elementary that perhaps the most important fact in determining what comes out of a medical school is what goes in. If only poor material goes in, the school is doomed to failure.

The Council has made certain recommendations. The first is that the minimum requirement of two years of college work be raised to three. The percentage of graduates of medical schools who have actually had three years of premedical work has been steadily rising in recent years and is now over 90.

The reasons given for this recommendation are several. In the first place, although the mere length of time spent in college is not a good test of fitness, the additional time may be used to give a more nearly adequate testing of the material. We are too often deceived, or deceive ourselves, by formal standards. There is the oft repeated statement that each year about 12,000 candidates try to squeeze themselves into 7000 places in the entering classes in medical schools, and that of the rejected 5000 many would be accepted if the schools were larger. But a more intensive study of the real qualifications of those accepted suggests that perhaps not more than 4500 are really well qualified to undertake the study of medicine.

Modern scientific medicine requires for its understanding more knowledge of the fundamental sciences on which it is built, and more of the sciences allied to the basis of professional activities. Employing two words in a narrow and popular and therefore inaccurate and perhaps misleading sense, the physician needs science and culture in his education. Science of course may be cultural, but what the physician needs is an understanding of the human body as a very complex machine and an understanding of the human being as an infinitely complex personality. Two years in a special premedical course, whether in junior college or in some other type of institution, do not ordinarily give a sufficiently wide and deep foundation for the heavy superstructure of purely professional education. There are those who think that four years in college are not too much, but the wisdom of adopting this as a minimum requirement for all is questioned.

As something over 95 per cent of all graduates of medical schools now take an internship before entering practice there has been a tendency to make such apprenticeship a formal requirement. One finds confusing tendencies, as the payment in some institutions of substantial salaries to interns. One should keep in mind the various purposes of the internship and should emphasize that which in the

long run will give the best result. The ideal is the education of the intern. That the ideal cannot be pursued uncompromisingly is evident at once, because every hospital of 100 beds certainly needs the services of the intern, but a hospital is not primarily an educational institution for any group. Such education, whether of medical student, intern, nurse, teacher or administrator, is a secondary function which many hospitals may never be able to perform in a satisfactory manner. It is, however, well established that patients in a hospital will receive better care, if, other things being equal, the hospital participates in some form of education. If interns are paid a substantial salary, the hospital is likely to think that its obligation closes with the sending of the pay check, and deterioration of the medical education of the intern is sure to follow.

One of the crying needs is an authoritative determination of when a "specialist" is not a specialist. "Self-anointed" specialists are all too common. It may be that governmental regulation will be the best method of control, but the voluntary specialist examining boards, of which there are now twelve, have begun a noteworthy and valuable service. Already their influence has been important in clarifying some of the issues involved in graduate medical education but their work lies chiefly ahead of them. They are confronted by at least one danger, that of regarding themselves, as did the medical guilds, as formed for the purpose of protecting themselves.

If one surveys the whole field of the healing art, the widespread interest in it on the part of the public, and the vast complexity of its problems as an integral part of the life of society, one comes to the very simple conclusion that what medicine needs most, in order that the profession may meet its responsibilities, is character and brains and leadership. It is the part of medical education to discover, select and train, in such ways as may be possible, physicians who not only minister to the needs of individuals but also are able to take their proper place as advisers and participators in shaping the policies of the communities, whether small or large, of which they are a part.

It is not likely that the problems of professional licensure will be easily solved in the best way by the efforts of one profession alone, and the general problems of this nature were discussed by Mr. John K. Clark, of the New York Board of Law Examiners. In spite of the many differences of background of lawyer and physician, one of which is that the lawyer practices as an officer of the court and therefore under the judiciary while the physician is licensed under legislative authority, certain common principles of qualification exist, such as knowledge of the principles of the subject, ability to analyze a complicated state of affairs and to select the principles which apply to the specific problems involved, skill in the application of these principles, and ability to make a clear statement of the application. But the determination of fitness, the prime function of a licensing board, has its chief difficulty not in the field of acquisition of knowledge by the candidate but in the field of character. Here the opportunities for insight in medicine are much greater than in law, because of closer contact of student and teacher in laboratory and clinic and especially in hospital. In the law school much of the instruction is didactic. In law as in medicine the character of the candidate is of crucial importance, and in New York co-operation between school and licensing authority in an effort to determine the character of the applicant has been helpful. In some law schools, however, and especially in the part-time schools, the teachers know practically nothing about

the students in this very important respect. One serious difficulty in determining what kind of lawyer, for example, the candidate will prove to be, is that character development is not complete at the age of twenty-one or twenty-two. Better insight is needed, based on better acquaintance, and the procedure in Pennsylvania will perhaps be helpful. There, each candidate for a law degree is assigned to a practicing lawyer whose duty it is to make a personality study. He may be in a position to do some teaching, especially in giving the right point of view in approaching the practice of law, some evaluating, and some advice and direction. It has been found that a substantial percentage of the candidates are advised not to go on in the course.

A strong plea was made by Father Alphonse M. Schwaltz, of St. Louis, for closer incorporation of the medical school in the university, for both can profit greatly by close association. It is not clear which would profit more, probably varying with conditions, but each has a significant contribution to make to the solution of their common problems. In the association are two dangers: too much federalization and too much individualization. Perhaps the most important field in which the university can be of help is to make clear the social implications and obligations of medicine.

In recent years the problem of specialism in medicine has received considerable attention. It is not new, however, and Dr. Willard C. Rappleye, of New York, noting the proposed requirement of three years of collegiate work before entrance to the medical school, reminded the Congress that if this becomes effective in 1940 it will be on the 800th anniversary of the requirement by Roger, of Sicily, that three years of college work should precede the beginning of the study of medicine in the university of his day. It is interesting to note how thought in one field may fertilize another related field. Study of the needs of the specialist examining boards helps to make clear the needs of graduate education and the need in the specialties for persons with better training in the fundamentals of the undergraduate medical course and in the premedical fields. From this study came Dr. Rappleye's suggestion that for better co-ordination and co-operation of all medical interests there should be formed a national medical council—non governmental in nature, advisory in function—to make a further study of the preparation of the physician for his work. The suggestion is worthy of careful consideration by the whole medical profession and by all persons interested in the future health program of the entire country.

The proposal to limit student enrollment in medical schools always stimulates controversy so that it is difficult to get a consideration of the subject on its merits. Dr. Walter M. Kotschnig, of Smith College, presented an excellent exposition, perhaps because he was not handicapped by being a physician. He pointed out what has been noted before, especially by non medical students of the subject, that while the limitation in a given school may be reasonable if it is based on the real capacity of the school, a general limitation because someone thinks that there are too many doctors has nothing actual to support it, because an accurate determination of how many physicians are needed has never been made. There should be a scientific definition of the demand and some sort of calculation of future demands, which can be at best only an approximation. It may be that some restraint should be exercised, as a result of previously made scientific determinations, but such restraint should be characterized by lack of constraint and should be based on comprehension of all available information. The studies should be made not by but with persons of the professional group, for on ac-

count of possible results, the profession might be regarded as prejudiced in favor of restriction. After all, the greater need is for improvement of the physicians rather than for increase or decrease in their number.

Various limited aspects of the undergraduate teaching of medicine were discussed: clinical medicine by Dr. Burrill O. Raulston, California, preventive medicine by Dr. J. G. FitzGerald, Toronto, obstetrics by Dr. James R. McCord, Georgia, and nutrition by Dr. Salvatore P. Lucia, California.

One morning was devoted to a symposium on graduate medical education, a subject to which more attention has been directed each year recently. If one notes what is done now, compared with fifteen years ago, astonishing progress has been made. But if one considers what the specialist examining boards think advisable in the preparation of their diplomates, one sees that only a beginning has been made. In these discussions the needs of the general practitioner for continued preparation received constant attention.

Two sessions were devoted to problems which especially concern state boards of licensure. Since internships are now taken by over 95 per cent of the graduates of medical schools each year and since there are many more internships available than there are candidates to fill them, it has been suggested that one year of internship be required by law before admission to examination for registration. Twenty states either have already made or will soon make this requirement. At first sight the proposal seems reasonable, but closer study makes it evident that the matter is not so simple as it appears. How much is the internship worth? What kinds of internship are available? What kind of internship is desirable? Two ideas dominate the situation, and they are not immediately compatible without qualification: the internship is for the further education of the physician—the internship is for the purpose of getting some necessary hospital work done.

It is well known that there is exploitation of interns, this follows from the fact that the hospital takes no responsibility for seeing that the intern is given the opportunity to make the most of his experience. In some of the so-called teaching hospitals, that is, those which are identified with medical schools and in which teaching of undergraduate medical students is constantly carried on, carefully planned courses for the training of interns are provided. But such hospitals are relatively few, and if it is difficult to find enough teachers of medicine to man the teaching hospitals, what hope is there that hospitals remote from medical schools will have adequate teachers for interns?

A question on which there is vigorous controversy is the requirement by some boards of registration that the year of internship be on a rotating service. The result is that some states will not accept the one year straight internship, which is the kind of experience received in the teaching hospitals by the best of the recent graduates. To what extent this is militating against the admission to practice in these states of the better grade of physician is not clear, but if the regulation is rigorously enforced, it will undoubtedly have a deleterious effect. In this controversy what is usually forgotten is that the mechanics of education is of less importance than the personal quality of the teacher. The hospitals remote from the medical schools do not as a rule have on their staffs physicians who are interested in teaching. Until hospitals more generally recognize and accept a responsibility for educating the interns, it is generally agreed that it is unwise to require the internship before admission to examination.

The problems presented to state boards of registration

by candidates who have received their medical education abroad and who seek admission to practice in the United States are numerous and vexatious. It is not so much that the standards for admission to practice in foreign countries have been appreciably lowered, but that often the persons who make application for registration in the United States have not been permitted to fulfill all the requirements for entering practice in the country in which the school is situated. Sometimes they have been allowed to take all the courses and examinations but for racial reasons have been refused degrees or have been refused licensure in the country in which they studied. Often clinical opportunities have been restricted to certain groups, or the course given to foreigners has been different and less rigid than that given to nationals. There is urgent need for some uniformity of procedure in evaluating the credentials from foreign medical schools.

One example of what can be done in a limited field was given by Dr. William C. MacTavish, of New York, who in co-operation with a small group of interested persons has been securing information about American students in Italian medical schools. When in 1933 there were published the rulings of the American Medical Association and of the Federation of State Medical Boards with reference to accepting Americans who had studied in foreign medical schools, there was expressed resentment on the part of a considerable element in the Italian-born American population at the alleged reflection on Italian medical schools. It required long-continued, patient and tactful negotiations, in which the official Italian representatives were most co-operative and fair-minded, to reach the present satisfactory arrangement. American students who wish to study medicine in Italian schools are required to file their credentials with the nearest Italian consul. The papers are forwarded to the Italian Consul General in New York and are evaluated by Dr. MacTavish as they would be for an approved medical school in the United States, except that the candidate must show sufficient knowledge of Italian to be able to profit by his study abroad. By this procedure many persons who are unsuited are prevented from going. For the benefit of those who are accepted, sixty-five internships in Italian hospitals are reserved. The Italian authorities have expressed themselves as much gratified with the distinct improvement in the candidates from the United States admitted under the present procedure, as contrasted with those under the previous unsupervised method. It is an example of what can be accomplished by intelligent effort.

There was a symposium on the promulgation of regulations authorized by law, and a resumé of the effects of the basic science law in Minnesota, which include a considerable reduction in the number of new registrants in osteopathy and chiropractic. There is no general agreement that this procedure is the best way of dealing with the problem presented by the cults.

NOTICES

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The American Association for the Study of Goiter, pursuant to its accepted invitation and to correspondence with the honorary presidents and attending members of the First and Second International Goiter Conferences, announces that the Third International Goiter Conference is to convene in Washington, District of Columbia, September 12 to 14.

The subjects proposed for discussion are as indicated in the outlined tentative program given below

Physicians and others in the United States and in other countries desirous of participating in the program are requested to submit titles at their earliest convenience. Since the time which it is possible to allocate on the program is obviously limited, it will be necessary for the Program Committee to exercise its best judgment in the selection of speakers and to insist without exception that the speakers conform to the time allocated

Manuscripts of addresses, papers and discussions delivered or read at the meetings are to be published in extenso in the form of transactions.

The official language of the conference will be English. Interpreters will be furnished for papers read in other languages

For further information concerning the conference, communicate with the chairman of the Program Committee (Allen Graham, M.D., 2020 East 93 Street, Cleveland, Ohio)

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OUTLINE OF TENTATIVE PROGRAM

First Day Subjects Endemic Goiter, Creunism and Myxedema.

Etology	Iodine
Pathology	Prophylaxis
Types	Thyroiditis
Geographic distribution	Malignant goiter

Second Day Subjects The Thyroid in Relation to Metabolism, Nutrition and Endocrine Glands Physiological and pathological interrelation and clinical application

Oxidation	Parathyroid
Sugar metabolism	Pituitary
Water balance	Adrenals

Third Day Subject. Hyperthyroidism.

Basal metabolism	Types	Diffuse toxic goiter
Iodine		Nodular toxic goiter
Complications		
Recurrences	Treatment	Nonsurgical
Goiter heart		Surgical

The subdivisions under the subjects above are for illustrative purposes only and are not to be considered as all inclusive or exclusive.

CLINICS FOR CRIPPLED CHILDREN IN MASSACHUSETTS, UNDER THE PROVISIONS OF THE SOCIAL SECURITY ACT

CLINIC	DATE	ORTHOPEDIC CONSULTANT
Lowell	April 1	Albert H. Brewster
Salem	April 4	Harold C. Bean
Haverhill	April 6	Arthur T. Legg
Gardner	April 12	Mark H. Rogers
Brockton	April 14	George W. Van Gorder
Worcester	April 15	John W. O'Meara
Pittsfield	April 18	Francis A. Slowick
Springfield	April 20	Garry deN. Hough, Jr
Fall River	April 25	Eugene A. McCarthy
Hyannis	April 26	Paul L. Norton

NEW BEDFORD CANCER CLINIC

The New Bedford Cancer Clinic in conjunction with the State Cancer Commission will hold a public demonstration clinic of cured cases of cancer at the Outpatient Department of St. Luke's Hospital, New Bedford, on Wednesday, April 13, at 4 00 p m.

All physicians in this district are invited to attend clinic.

CURTIS TRIPP, M.D., *Sec*

TUFTS MEDICAL ALUMNI DINNER

The annual dinner of the Alumni Association of College Medical School will be held Wednesday, 30, at 7 00 p m at the Copley Plaza Hotel, Boston. For reservations call Hub 9670

ROBERT T. PHILLIPS, M.D., *Sec*

MASSACHUSETTS MEMORIAL HOSPITALS

The annual reunion of the House Officers Association of the Massachusetts Memorial Hospitals held on Saturday, April 23, at 10 00 a m. in the Co Memorial Building

WELMAN B. CHRISTIE, M.D., *Secretary-Treas*

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Beth Israel Hospital, on March 28, at 8 15 p m.

PROGRAM

The Incidence of the Criteria of Allergy in Cases of Asthma. Dr Hyman Morrison.
The Significance of Electrocardiographic Changes in Attacks of Angina Pectoris. Dr Joseph E. F. R.
The Relation of Blood Pigment Metabolism to the Change in Blood Volume in Congestive Heart Failure. John Waller.
The Effect of Digitalis in Partial Heart Block. Dr D. Altschule.
The Clinical and Pathological Manifestations of Coronary Arterial Disease as Disclosed by Injection Plus Angiogram Studies. Dr David Davis.
The Breath-Holding Test: A simple standard test for blood pressure. Dr David Aymon.
Cardiac Cirrhosis. Dr Herrman L. Blumgart.
Interested physicians and medical students are invited to attend.

JAMES M. FAULKNER, M.D., *Secretary*

HAMPSHIRE DISTRICT MEDICAL SOCIETY

The annual meeting of the Hampshire District Medical Society will be held at the Dickinson Hospital, Northampton, on Wednesday, May 11, at 11 30 a m.

JOSEPH D. COLLINS, M.D., *Secretary*

BOSTON SOCIETY FOR THE ADVANCEMENT OF GASTROENTEROLOGY

The next meeting of the Boston Society for the Advancement of Gastroenterology will be held at the Carney Hospital, on Wednesday, March 30, at 12 o'clock noon.

Case demonstrations will be given by Drs. Louis F. Ran, A. McKay Fraser, William E. Browne, Ed Leonard and Norman A. Welch, of the medical surgical staffs.

Physicians, medical students and nurses are cordially invited to attend.

CHARLES W. McCURE, M.D., *Secretary*

THE JOHN T. BOTTOMLEY SOCIETY

The John T. Bottomley Society of the Carney Hospital Outpatient Department will hold its regular monthly meeting on Tuesday, April 5, at 11.30 a m.

Dr Laurence McGrath will speak on "Allergy"

WILLIAM J. MACDONALD, M.D., *Secretary*

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen, discussed, and when indicated, treated with radium and high voltage x ray.

Physicians are welcome to visit this clinic and bring a patient to the clinic for diagnosis.

RADIO BROADCASTS

The seventh group of weekly broadcasts sponsored by the American Medical Association and the National Broadcasting Company concern health education. These dramatized health messages are intended to furnish supplementary material for health teaching in junior and senior high schools and are broadcast every Wednesday from 2:00 to 2:30 p. m. over the Red Network. The dates and subjects are as follows:

March 30—A Fool for a Day. Fallacies and popular beliefs that are not true and that influence behavior in a manner detrimental to health.

April 6—Living with People. Elements of mental hygiene, getting along with people, adjustment to the environment.

April 13—It May Happen to You. Accidents in the home and on the highway and ways to avoid them.

April 20—Who Chooses Your Doctor? The characteristics of a reputable physician as distinguished from quacks, fakers, faddists or exploiters.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MARCH 28

MONDAY MARCH 28

8:15 p. m. New England Heart Association. Beth Israel Hospital

TUESDAY MARCH 29

*9-10 a. m. Boston Dispensary. A Clinical Evaluation of the Blood Sedimentation Rate as a Routine Diagnostic Procedure. Dr. Elbert B. Agner

*10 a. m. 1:30 p. m. Tumor clinic. Boston Dispensary

WEDNESDAY MARCH 30

*9-10 a. m. Boston Dispensary. Hospital case presentation. Dr. S. J. Thannhauser

12 m. Clinicopathological conference. Children's Hospital amphitheater

12 m. Boston Society for the Advancement of Gastroenterology. Carney Hospital.

7 p. m. Tufts Medical Alumni Dinner. Copley Plaza Hotel Boston

THURSDAY MARCH 31

8:30-9:30 a. m. Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals, held this week at the Children's Hospital

*9-10 a. m. Boston Dispensary. Interesting Clinical Problems from the District Service. Dr. Isidore Olef.

FRIDAY APRIL 1

*9-10 a. m. Boston Dispensary. Specific Therapy for Certain Anemias of Childhood. Dr. Louis K. Diamond.

10 a. m. 12:30 p. m. Tumor clinic. Boston Dispensary

12 m. Clinical meeting of the Children's Medical Service, Massachusetts General Hospital. Ether Dome.

SATURDAY APRIL 2

*9-10 a. m. Boston Dispensary. Pneumonia. Dr. Joseph H. Pratt

10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian.

SUNDAY APRIL 3

4 p. m. Illustrated public health lecture, Faulkner Hospital auditorium. Nerves and Their Relation to Insanity. Dr. Merrill Moore.

Open to the medical profession.

MARCH 25—Staff meeting of the Massachusetts Memorial Hospitals. 8:15 p. m.

MARCH 28—New England Heart Association. Page 546.

MARCH 28 APRIL 1—Postgraduate Institute of the Philadelphia County Medical Society. Page 282. Issue of February 10.

MARCH 30—Tufts Medical Alumni Dinner. Page 546.

MARCH 30—Boston Society for the Advancement of Gastroenterology. Page 546.

APRIL 13—Springfield District Teaching Clinics. Page 499. Issue of March 17.

APRIL 4-8—The American College of Physicians. Page 41. Issue of July 1.

APRIL 5—Greater Boston Medical Society. 8:30 p. m. auditorium of Beth Israel Hospital Boston.

APRIL 5—John T. Bottomley Society. Page 546.

APRIL 13—New Bedford Cancer Clinic. Page 546.

APRIL 13—Eastern Hampden Medical Association. Page 499. Issue of March 17.

APRIL 14—Pentucket Association of Physicians. Hotel Bartlett, 95 Main Street Haverhill. 8:30 p. m.

APRIL 13—Boston Medical History Club. Boston Medical Library. 8 Fenway Boston.

APRIL 18, 19 and 20—Thomas William Salmon Memorial Lectures. Page 450. Issue of March 10.

APRIL 23—Massachusetts Memorial Hospitals, annual reunion of house officers alumni association. Page 546.

APRIL 26—New England Society of Psychiatry. Page 322. Issue of February 17.

MAY 31, JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society. Hotel Bradford Boston.

JUNE 6, 7, 8, and 9—American Association of Industrial Physicians. Page 499. Issue of March 17.

JUNE 13-17—American Medical Association. San Francisco.

JUNE 13, OCTOBER 3 and NOVEMBER 15—American Board of Ophthalmology. Page 282. Issue of February 10.

SEPTEMBER 12-14—American Association for the Study of Gout. Page 545.

OCTOBER 17-21—Clinical Congress of the American College of Surgeons, New York City.

OCTOBER 24-26—Academy of Physical Medicine Scientific Session. Washington D. C.

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p. m. New Bedford.

ESSEX SOUTH

APRIL 6—Gloucester Hospital Gloucester. Clinic at 5 p. m. Dinner at 7 p. m. Speaker and subject to be announced.

MAY 5—Censors meet at Salem Hospital, 3:30 p. m.

MAY 11—Annual meeting Salem Country Club Peabody. Dinner at 7 p. m. Speaker and subject to be announced.

FRANKLIN

Meeting will be held at the Franklin County Hospital Greenfield, at 11 a. m. the second Tuesday of May.

HAMPTON

Meetings will be held on the fourth Tuesday in April and July.

HAMPSHIRE

MAY 11—Page 546.

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club, Stoneham at 12:15 p. m. on May 11.

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27.

NORFOLK DISTRICT

MARCH 29—Page 500. Issue of March 17.

MAY—Annual meeting.

The censors meet on the first Thursdays of May and November in each year.

NORFOLK SOUTH

Meetings held at 12 noon.

APRIL 7—At the Quincy City Hospital.

MAY 5—Annual meeting.

PLYMOUTH

Meetings will be held at 11 a. m. on April 21, May 19 and July 21.

WORCESTER

APRIL 13—Hahnemann Hospital, Worcester. Dinner will be at 6:15 to be followed by business session and scientific program.

MAY 11—Afternoon and evening, annual meeting. Place and schedule of program to be announced.

BOOK REVIEWS

Diathermy Including diathermotherapy and other forms of medical and surgical electrothermic treatment Elkin P. Cumberbatch. Third edition 576 pp. Baltimore: William Wood & Company, 1937 \$6.00

The author of this book, an Englishman, is one of the few living men who have worked with electrotherapy from its beginning. He is thoroughly conversant with diathermy of the "long wave" (300 meter wavelength) type, which uses metal electrodes in contact with the body. A large portion of the book is devoted to that type of current. Unfortunately, this procedure is being used less and less, and manufacturers in this country have practically stopped making such machines.

The book is divided into three parts: (1) "Physical and Electrotechnical Principles," (2) "Medical Electrothermic Methods and Their Uses," (3) "Surgical Electrothermic Methods and Their Uses." The chapters dealing with the physics of the high-frequency currents, largely written by Dr. H. J. Taylor, physicist to the Institute of Physical Medicine, are excellent for those desirous of knowing how high frequency apparatus is made and what may be expected by its use. Unreasonable space has been allotted to subjects which would be clearer and more readable if fewer pages had been written. For instance, a chapter of forty pages is devoted to a discussion of recorded body temperatures following the long-wave type of diathermy. Three hundred and ten of the five hundred and fifty pages are devoted to long-wave diathermy and its relation to medical procedures. The balance deals with surgical procedures, largely by the older method. Only fifty pages are given to theory and an inadequate allusion to the short wave diathermy.

There is much repetition occurring throughout. Far too much space has been allotted to the elementary details, while frequently not enough definite scientific information has been given to more important aspects. It is thoroughly unsatisfactory as a textbook on diathermy here in America where we have largely discarded long wave diathermy and are bending our energies toward proving what seems to be advantageous in the short-wave field.

The real usefulness of this book lies in the help it offers teachers in obtaining details of the history of high-frequency currents, some of their applications, and—perhaps most important of all—their physics.

Alcohol One man's meat Edward A. Strecker and Francis T. Chambers, Jr. 230 pp. New York: The Macmillan Company, 1938 \$2.50

This is a volume written by Dr. Strecker with the assistance of a former patient. It approaches the problem from a psychological aspect, which method of attack is in accord with the best medical opinion of the day. The treatment of alcoholism is a matter for the attention of a psychiatrist preferably, yet regularly all medical men are confronted with the problem of how to handle situations in which the abuse of alcohol looms large.

Normal and abnormal drinkers are discussed and the drives motivating them are examined in terms of adjustment, not to alcohol itself but rather to the background of the drinker. The inheritance of a nervous system which is non-resistant to alcohol is not held a bar, by the authors, to a routine of activity and achievement. It is their contention that there are no half-measures possible for the alcoholic. He must avoid even a single drink

since his resistance, but not necessarily his physiological tolerance, is so much below the average man's threshold.

Approximately one half the book is devoted to a discussion of the treatment of alcoholism. Acknowledgment is made to the late Richard Peabody, of Boston, and the lines laid out for a therapeutic rationale closely approach those devised by him.

Manual of Clinical and Laboratory Technic Hiram B. Weiss and Raphael Isaacs. Fifth edition, reset. 141 pp. Philadelphia and London: W. B. Saunders Company, 1937 \$1.50

This is an unusually fine little book, remarkable for the completeness with which it covers the whole field of medical examination, and showing a mastery of medicine by the authors which has come from years of experience in the laboratory and the clinic. In its fifth edition it should continue to prove useful to student, intern and practitioner.

One of its features is that it includes the newer tests not yet available in the standard textbooks and found only in current periodical literature. Among the material added in this edition are additional tests for Bence Jones substance, methods of counting cellular elements and of measuring the amount of vitamin C in the urine, a graph for the conversion of percentage of hemoglobin to grams, methods of calculation of various blood indices, new methods for determining the clotting and retraction times of the blood, a listing of the characteristics of the blood in pyogenic infection, methods of measuring the diameter and volume of the red-blood cells, and of oxidase staining, the technic of the sheep-cell agglutination test in infectious mononucleosis, of hydrogen-ion concentration determinations of gastric juice and of the Neufeld reaction for pneumococcus types, methods of counting the cells of the saliva and of the bone marrow, descriptions of the Nonne-Apel reaction, liver function tests, the Takata-Ara reaction, the technic for determining the albumin-globulin ratio in blood serum, and for making the Congo red test for amyloidosis and diagnostic tests for undulant fever. The normal standards for each test are given, and certain details in the interpretation of tests and their clinical application are discussed. A comprehensive table of nutritive values of foods and a complete index add to the value of this manual.

A Practical Treatise on Diseases of the Skin For the use of students and practitioners Oliver S. Ormsby. Fifth edition, thoroughly revised. 1334 pp. Philadelphia: Lea & Febiger, 1937 \$12.00

All students of dermatology will be interested in this new edition of "Diseases of the Skin." Whereas the greater part of the material is essentially the same as in the previous edition, twenty new diseases have been described, and other material has been rewritten. New illustrations have been added, principally photomicrographs, which is indication of the growing interest in the pathology of dermatology.

The mycologic side is treated as fully as could be expected in a work of this scope. Sabouraud's standard classification of the tinea is given, but no reference is made to the newer attempts at classification.

This book is a vast storehouse of description of disease, etiology, differential diagnosis and treatment. Its possessor may feel himself fortunate in having so much information in one volume, which is easily available. A very complete bibliography is provided.

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WRINGER ARM

A Report of Twenty-Six Cases

DONALD W. MACCOLLUM, M.D.*

BOSTON

MANY of the terms describing entities in medicine depend largely on Latin or Greek for their derivation, so that one word is often a succinct descriptive expression of a recognized syndrome. It is of interest to note that occasionally a particular disease or accident becomes so intimately associated with its causative agent that an idiomatic, though not entirely scientific, term which soon becomes acceptable to the medical mind, is applied to it. Examples of the latter are frequent.

With the advent of the automobile came the chauffeur's fracture which, in turn, has become more and more of a rarity with the invention of the self-starter. Similarly, the electric waxer, the mechanical loom and the silent policeman have resulted, respectively, in the now relatively infrequent occurrence of housemaid's knee, weaver's bottom and policeman's heel. At present, riveter's wrist, tennis elbow, baseball finger, bumper fracture, park-bench paralysis and writer's cramp have become unofficial diagnostic terms. Into this same category falls one more, previously undescribed, which I shall designate as "wringer arm."

In the days when clotheswringers were turned by hand, a pinched finger or a crushed thumb was often encountered, but seldom was an entire arm drawn between the rollers. With the progress in mechanization, however, the invention of the electric clotheswringer so appealed to the public that over thirteen million of these machines are estimated to be in use in the United States†. One result of this popularity has been a series of accidents to small children. The steady increase in the frequency of such arm injuries parallels the increase in sales (Table 1).

The turning rollers fascinate the child and lure him to closer investigation. In spite of the numer-

ous safety devices which have been developed on some wringers, there are none to prevent the fingers' being caught. Once they are engaged, the entire arm is usually pulled between the rollers so suddenly and with such force that the child is unable to extricate himself. He is found screaming with pain and from fright, with the rollers churning away in his axilla. If the mother keeps her head

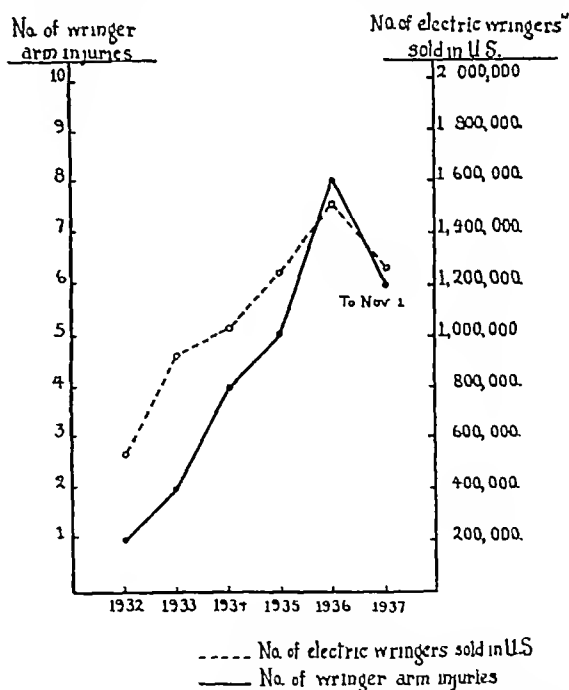


Table 1 The frequency of wringer arm injuries shows the same general curve as that of the number of electric wringers sold in the United States

she will strike the safety release and liberate the arm. Very frequently, however, her first impulse is to reverse the direction of the rollers and exert countertraction upon the child, thus subjecting the arm to a second crushing.

This accident may occur in all age groups, but is most frequent in early childhood. In this series

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*Personal communication from the American Washing Machine Manufacturers Association, Chicago, Illinois.

of 26 cases, the age of the patients varied from one to seven. Twenty-two accidents occurred in children between two and five. Over twice as many boys as girls were injured.

The extent of the injury is variable, dependent upon the speed of the machine, the gap between the rollers and the length of time that the arm is subjected to crushing. If the child is young the injury may be less severe on account of the elasticity of the soft tissue and the flexibility of the ligaments and joints. In none of the cases in this series were there demonstrable nerve injuries. There were minor fractures in only 2 cases, a green-stick fracture of the ulna, and a subperiosteal crack in the proximal phalanx of the fifth finger. The primary trauma in every case was to the skin, subcutaneous tissues and muscles. In each instance there were marked ecchymosis, edema of the subcutaneous tissues and abrasions of the skin. Three patients received lacerations which required suturing (Figs 1, 2A and 2B). In several others there were diffuse hematomas beneath the skin or in the muscles. One of the hematomas required aspiration, the others gradually resolved. In the 7 most severely injured patients there was sufficient trauma to cause necrosis of the skin and underlying tissues. After these areas sloughed, plastic surgery was required for repair of the defects.

Because of the infrequency of this accident in the same home or in the same neighborhood, there is fortunately no standard home remedy that is employed before the doctor is called. In reality, witnesses to this accident generally think that the injury is much more severe than it actually is. Because of the parents' concern, the patient is usually seen by the doctor from fifteen minutes to an hour after his injury. At this time he has usually recovered from the shock of the accident. Even at this stage, the arm is apt to be markedly swollen, with many abrasions distributed over the injured portion (Fig 1). The intact skin is usually blotchy and shows evidence of interstitial hematomas, edema and areas of residual ischemia caused by injury to the vessel walls. In some cases there is definite subcutaneous crepitation. This is thought to be caused by destruction of the cell walls and bleeding in the fatty layer. It is not, as might be supposed, produced either by air beneath the skin or by injury to the bone. It must be emphasized that the extent of the injury to the soft parts cannot be properly evaluated at this first examination, so that the prognosis at this time must be guarded. Examination for fracture at the initial examination is difficult because of the swelling and tenderness, so that in every case an x-ray

photograph should be taken. If a fracture exists, extreme care must be used in the application of splints to avoid an ischemic paralysis. In the 2 cases of fracture in this series the associated injuries to the soft parts were of more importance and required more attention than the fractures, so that no splints were applied.

The treatment of the fresh injury differs from the treatment of one that is several days old. If the patient is seen shortly after the accident the arm



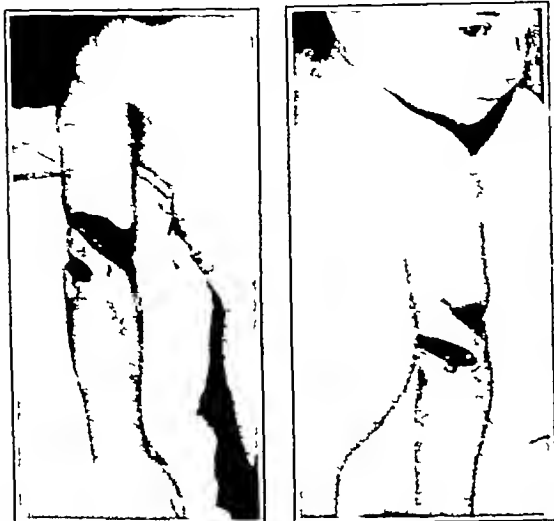
Figure 1 Case 1, a boy of twenty months. The photograph shows the marked edema and ecchymosis of the right arm only two hours after injury. A bandage covers a small laceration of the thumb.

must first be immobilized either by a sling or by sandbags. The edema must be reduced as rapidly as possible. To accomplish this, iced packs of concentrated magnesium sulfate are applied continuously for the first twenty-four hours. For the second twenty-four hours, these packs are alternated every two hours with hot magnesium-sulfate packs. If there has been extensive maceration of the skin, dry heat may be used alternately with the cold packs. A rigid aseptic technic must be carried out in the treatment of the abrasions. These should be properly cleansed with antiseptic solutions and kept from contamination. This is of extreme importance because sepsis developing in this devitalized tissue may endanger the patient's life from a resulting septicemia. In this series, 6 patients treated ineffectually for several days at home entered the hospital suffering from a septicemia due to a hemolytic streptococcus. All recovered, but in

each case the infection had destroyed tissue over the arm and thus delayed the local healing

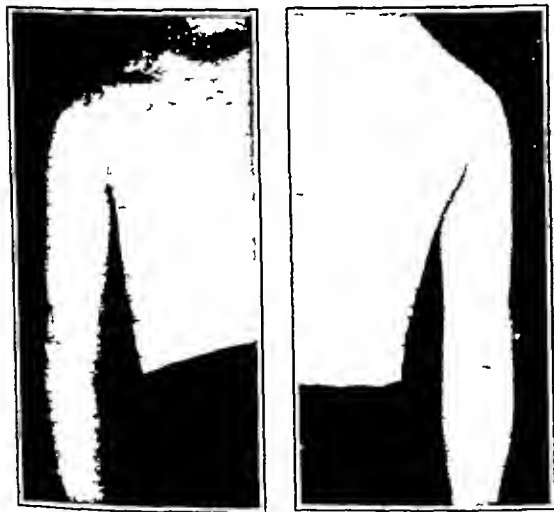
When the patient is seen several days after the accident, he may be found to be recovering from

sick, and the temperature is elevated. When cellulitis exists, packs of hot normal saline or boric acid are applied continuously until the infection subsides. The patient's general condition is improved with transfusions and intravenous injections of glucose and saline. In recent cases in this series that were infected with hemolytic streptococci, sulfanilamide has been given with good effect. In



A

B

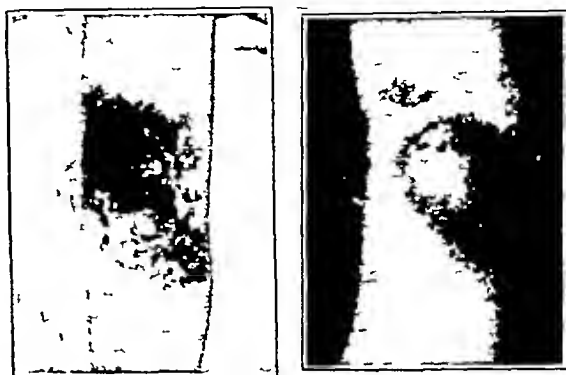


C

D

Figure 2. Case 2 a boy of three years - Seen six days after the accident. Photographs A and B taken six days after the accident show a spiral laceration of arm with necrosis of the edges of the incision. Photographs C and D show the result six months after excision of the necrotic edges and suturing of the freshened incision. function was normal.

the injury without sequelae. More often, however, two complications are found, alone or in combination the entire arm is swollen, red and painful, with evidence of diffuse cellulitis, or an area of necrosis has developed. The child is usually



A

B



C

Figure 3. Case 3 a boy of four and a half years. Photograph A shows the necrotic area above the elbow, three days after the accident. Photograph B shows the result eight days after a razor graft had been applied. note the residual ecchymosis of surrounding tissue from the original trauma. Photograph C shows the result six months after grafting.

all cases with cellulitis of the arm but without necrosis, the infection cleared with these measures. In cases with necrosis further treatment was necessary to effect healing.

Necrosis with sloughing of the devitalized tissue is slow in developing, making it almost impossible to judge at the first examination the severity of the injury to the soft parts. If the treatment outlined for fresh injuries is followed closely with the view to the reduction of the edema and the re-establishment of the normal circulation, a minimal

amount of sloughing will occur. In this series, necrosis occurred in 7 cases. Only 1 of these was seen shortly after the accident. The other 6 patients came to the hospital for treatment as late as six weeks afterward. When a dusky



A



B

Figure 4 Case 4 a boy of six years. Photograph A, taken three weeks after the accident shows the extensive ulceration of the inner aspect of the upper arm and the axilla, with limitation of movement at both the shoulder and elbow. Photograph B shows the result four weeks after razor grafting. Function has returned to normal.

ecchymotic area appears to be growing blacker, the ice packs are discontinued and hot packs are substituted. Light massage and passive movement may be indicated in selected cases. Although it has not been used in this group, the peripheral suction-pressure pump may be of value in aiding the circulatory return.

If the injured tissue does not respond to the

efforts made to revive it, the gangrenous portion will soon become demarcated from the viable portion. Figures 3A and 5A illustrate the typical appearance of an early slough. The edges will gradually retract from the normal skin, and the dead tissue will slowly fall away. It is unwise to perform an operative debridement at this stage because of the surgeon's inability to judge the depth of the slough; he may either remove it in completely and thereby accomplish little, or needlessly remove or injure normal viable tissue. Continued soaks in sterile saline or boric acid will accomplish the removal effectively. During this stage it is advisable to have a tourniquet and a sterile tray with gauze and arterial clips at hand. Although the thrombosis of the vessels is the cause of the necrosis, a severe hemorrhage may result from the sloughing of a deeper vessel that is in completely occluded. In all these cases the patient's blood should be typed and cross-matched with a suitable donor in preparation for such an emergency.

After the dead tissue has been removed, the site of the necrosis usually becomes cratered and covered with a thin layer of pale pink, chronically infected granulations. Figure 5B shows the appearance of the arm shortly after removal of the slough.

At this time the method for filling in this defect must be decided upon, and a correct evaluation of the amount and type of tissue that has been destroyed becomes necessary. In order to ensure the best functional and cosmetic result, all this tissue should be replaced. Replacement of subcutaneous tissue, fat and skin, if necessary, must be done by means of either a pedicle or an advancement flap of the neighboring tissue. To carry out either of these procedures at this time would be unwise because of the lowered resistance of the patient and of the decreased vitality of the skin in the immediate vicinity of the defect. When a flap is used, the low-grade sepsis which is almost invariably present in the recipient site causes a separation of the suture lines and a loss of part or all the flap. For this reason it has been found advisable to cover the raw surface with epithelium in the form of thick razor grafts. If contractures develop that cannot be remedied by exercise and massage, a pedicled flap can be utilized at a later date when it is possible to carry out the procedure in an aseptic field and at a time more advantageous for good healing. Case 5 (Fig 5) shows the result of an extensive slough over about one third of the arm. It appears that razor grafts on this site would not have sufficed to have prevented late contractures from the scar. Lymphedema of the

hand and limitation of movements were expected. However, neither in this case nor in any of the others in this series has it been found necessary



A

B

C

Figure 5 Case 5 a girl of sixteen months. Photograph A taken four days after the accident shows the extensive area of necrosis which completely encircled the arm. Note the ecchymosis and edema distal to the slough which was beginning to pull away from the upper portion of the arm. Photograph B shows the granulating bed after the necrotic area had been removed. Note the residual bruising over the forearm just proximal to the wrist. Photograph C shows the result fourteen days after razor grafting. The new skin is still irregular and shiny.

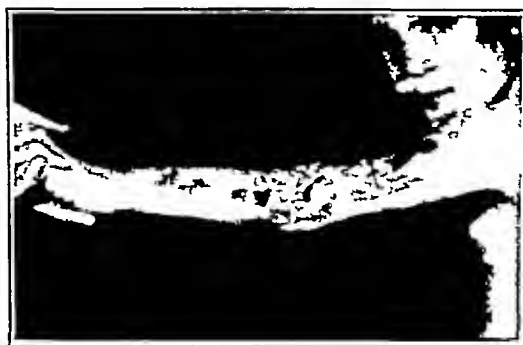
to do a subsequent graft. These results were exceptionally fortunate, and severe injuries such as those in Cases 4, 5 and 6 are likely to require the replacement of the subcutaneous tissue.

The technic of razor-grafting for unhealed burns

has recently been described by the author.¹ The same principles apply to crushing injuries, but certain variations are necessary to produce a good result. It must be remembered that there has been an extensive injury to the tissue surrounding the granulating area to be covered by the grafts (Fig. 3A, 4A and 5A). Because of this, the blood supply to the raw area is reduced and lymphatic drainage is impaired, so that the re-



A



B

Figure 6 Case 6 a girl of six years. Photograph A taken six weeks after the accident when she was seen for the first time shows the extensive raw area resulting from a combination of pressure necrosis and burn as this patient caught her arm in a hot triangle. Photograph B shows the result four weeks after the application of razor grafts. This patient is still under treatment.

ipient site becomes similar in many ways to that caused by an electric burn. The granulations are slow in forming and in becoming clean enough for grafting. To ensure a successful take of the graft it is necessary that the preoperative treatment be centered upon hastening the formation of healthy granulating tissue. The preoperative routine followed at the Children's Hospital is as follows:

The arm is given a daily bath of hypertonic saline for thirty minutes. The raw area is then

covered by Tulle Gras—wide-meshed paraffined gauze which has been impregnated with vaseline containing 1 per cent compound tincture of benzoin, and which has been autoclaved for forty-five minutes under 15 pounds' pressure. Over this gauze are placed gauze sponges soaked in Eusol, composed of boric acid 12.5 gm and chlorinated lime 12.5 gm in 1000 cc of water, which is allowed to stand for twelve hours and is then filtered. It is usually too powerful to apply undiluted, so that it should be emulsified with an equal amount of mineral oil. Dry gauze is placed over these dressings, which are held in position by a firmly applied elastic bandage. It is important that the arm be bandaged tightly enough to keep the granulations flattened, but not so tightly as to impair the circulation. In order to prevent the hand and fingers from becoming edematous, the elastic bandage should be started at the fingertips and carried up evenly to the axilla. If only a section of the arm is covered, the part distal to the bandage will become swollen and painful. In addition to these dressings, the arm should be immobilized with padded splints or sandbags. Plaster casts are to be avoided.

When the raw area has become cherry-pink and the patient is sufficiently improved to withstand the operative procedure, the case is ready for grafting. The patient is given a general anesthetic, and both donor and recipient areas are cleansed with soap and water, alcohol, and ether. The recipient site is prepared first. The granulations, together with their fibrous tissue base, are removed down to the normal subcutaneous tissue. Bleeding is controlled by arterial clips and by hot saline packs. Ligatures and all other foreign material are to be avoided.

A pattern of the defect is then made by pressing a dry, unbleached cotton cloth on the recipient site, when its contour will be outlined by a blood stain. The cloth is then inverted and covered with sheets of Tulle Gras. The grafts are cut and laid raw side up on the meshed pattern so that the edge of each will overlap its neighbor by 1 or 2 mm. The entire pattern is then transferred to the recipient area. The edges of the mesh pattern

are sutured to the normal skin to prevent the grafts from being displaced when the dressing is applied. A pressure dressing is next applied over the grafts. A gauze pad exactly the size and shape of the pattern is fixed evenly and securely to the recipient site by an elastic mesh bandage. Over this is placed more gauze, held in position by elastic adhesive and elastic crepe bandage. Here also the bandage should begin at the fingertips to avoid edema of the most distal portion. The arm is then immobilized in splints, care being taken to prevent rotation of the shoulder.

The dressings are first changed on the seventh or eighth postoperative day. By that time the area is usually completely healed, but protective dressings are needed for another week. Then active physiotherapy and occupational therapy may be started. Even in this age group the long immobilization results in a marked stiffness of the joints and muscles. The degree of impairment of function is much greater than that usually found where burns or fractures have been immobilized for the same length of time. The reason is not clear; it may be a fibrosis in the muscles resulting from either a mild degree of ischemia following injury or the organization of a hematoma. Exercise under water is of great benefit for hastening normal mobility, and may easily be carried out at home in the bathtub. Within six months the motion of all joints should be normal. The subcutaneous tissue proliferates beneath the graft and obliterates the depression caused by the original loss of tissue. If the grafting has been properly done, the surface smooths out and gives a good cosmetic effect.

SUMMARY

A series of 26 wringer-arm injuries is presented.

The immediate and late treatment of these injuries is outlined.

The variations in the technic of razor grafting used are briefly discussed.

300 Longwood Avenue.

REFERENCE

- 1 MacCollum, D. W.: The early and late treatment of burns in children. *Am. J. Surg.* 39:275-311 1938.

THE APICAL CHEST LEAD AS THE CHIEF AID IN THE DIAGNOSIS OF CORONARY OCCLUSION

HOWARD B SPRAGUE, M.D.,* AND SYLVESTER MCGINN, M.D.†

BOSTON

THE most definite advance in electrocardiography in many years has been the introduction of the recording of the electrocardiogram from lead points on the chest over the heart. For renewing the work in this subject in its clinical and experimental applications, we are indebted to Wolferth, Wood and their associates^{1, 2, 3}. The skepticism of five years ago as to its value in the diagnosis of coronary thrombosis gave way later to some overenthusiasm and the attribution to the chest lead of an ability to give specific information not possessed by the standard limb leads. As Roth⁴ has pointed out, there has been a tendency to disregard some of the obvious

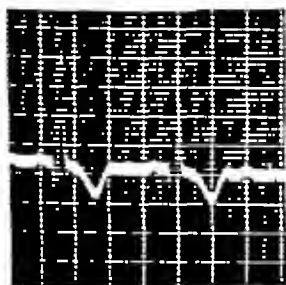


Figure 1 Normal Lead 4, with the right-arm electrode placed over the apex of the heart and the indifferent electrode on the left leg

abnormalities in the standard leads in this concentration on the new precordial records. It was with this idea in mind that we chose the title of this paper, and for illustration we present a series of cases in which the chest lead was the *chief* electrocardiographic aid, while admitting that the limb leads were by no means always normal.

Until June, 1937, the routine connection of the electrocardiograph for the chest lead at the Massachusetts General Hospital was through the Lead-2 wires—the right-arm electrode placed over the cardiac apex and the left-leg connection used as the indifferent electrode. This lead will be called Lead 4 in our discussion (Fig. 1). At present the left-leg electrode is placed at the apex and the left arm is the indifferent lead point. One of the cases reported here shows a chest-lead electrocardiogram taken with this technique.

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⁴This connection of electrodes reverses the polarity and the T wave is normally upright. The left leg is perhaps a somewhat better indifferent lead point than the left arm and is now used at the Massachusetts General Hospital (March, 1938).

Ninety-two patients with coronary thrombosis, recent or old, were seen by us, both standard and chest leads were recorded, and 16 cases were selected as showing in electrocardiograms evidence in Lead 4 unobtainable in the axial leads. In 1000 consecutive electrocardiograms at the Massachusetts General Hospital, 16 cases of coronary thrombosis were found, 3 being selected as representative of the value of Lead 4, and 2 other cases were found in the hospital files. There were therefore 21 cases in which Lead 4 was at some time in the course of coronary thrombosis the chief aid to the diagnosis. In this entire series the infarct was of the anterior type, as determined by the electrocardiogram, and our observations refer at this time to this type only. In 2 cases autopsy study was possible and was confirmatory.

The cases were divided into two groups, Group I comprising 14 in which Lead 4 showed the only positive evidence of *acute* coronary occlusion. In 12 cases changes were found in the conventional leads of the electrocardiograms that suggested the diagnosis but were insufficient to clinch it. They consisted of diphasic T waves in Lead 1 in 8 cases, associated with a very slight elevation of the S-T segment in half of them, low T waves and isoelectric T waves in Leads 1 and 2 in 2 cases, a sagging S-T segment in Lead 1 in 1 case, and bundle-branch block in 1. Four patients had had digitalis, and 11 had suffered from angina pectoris from 2 weeks to 2 years before the most recent coronary occlusion.

The changes noted in Lead 4 of Group 1 were found at intervals varying from twelve hours to eight days after the occlusion. There were 8 cases in which the Q wave was absent and in which the S-T segment was displaced downward, the T wave then went above the base line in most cases in a diphasic form. Three tracings showed upright T waves in Lead 4 and in 2 of these the Q waves disappeared three and six weeks later respectively. The T wave was diphasic with an early inversion in 1 case, and in 2 the Q waves were absent but the T waves were normal. These observations suggest that the commonest early change is a diphasic T wave with low origin of the S-T segment and absent Q waves, although it is not unusual to find upright T waves with the Q waves disappearing at a later time.

There were placed in Group II 10 cases in which Lead 4 showed the only definite evidence of a *previous* coronary occlusion. Six of these had changes in the conventional leads that might have suggested a previous occlusion, but they were indefinite. They were as follows: 3 tracings with sagging S-T intervals in Lead 1, 2 with diphasic T waves in Lead 1 and isoelectric T waves in Lead 2, and 1 with a low T wave in Lead 1. One patient had been taking digitals, and 5 patients had had angina pectoris for from two weeks to six years.

ties in Lead 4 in the presence of essentially negative conventional leads, in tracings taken eight, twenty and thirty days after the acute occlusion. These cases were also included in Group I as showing the most definite evidence of coronary occlusion in Lead 4. Two cases showed a diphasic T wave of low origin with the upward phase predominating—1 with an absent Q wave and 1 with a small upward Q wave. In the remaining case the Q wave was absent and there was an early inversion of the T wave. The most recent electrocardiogram of the case with the upward Q wave shows an absence of

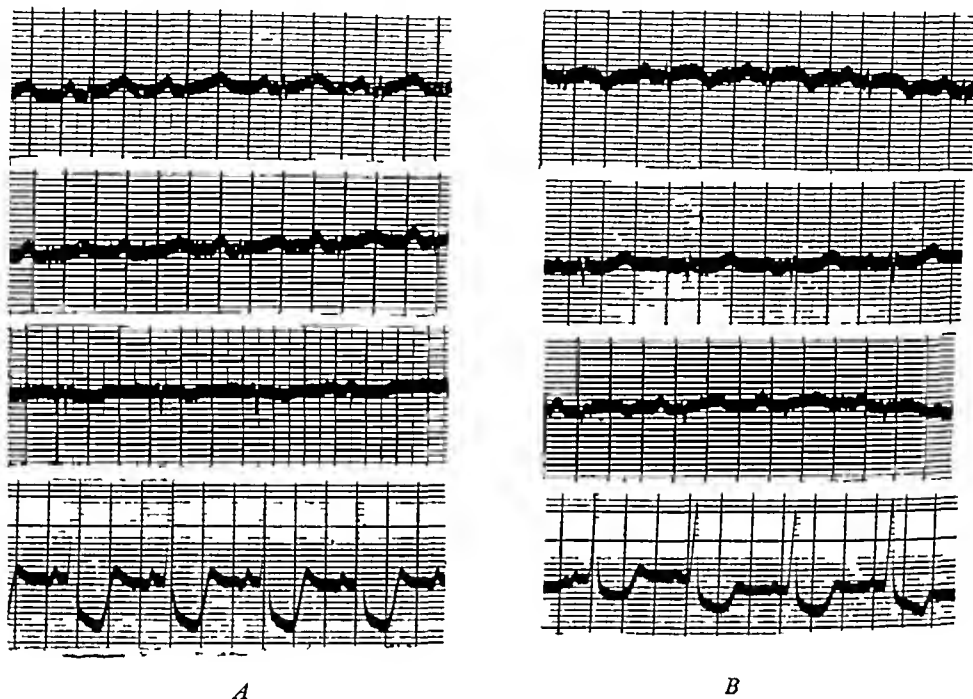


Figure 2. Case 1
A Six days after occlusion
B Fourteen days after occlusion

The changes found in Lead 4 followed coronary occlusions in 2 cases at intervals of one and three days respectively, and the intervals in the remaining cases varied from six weeks to two years. The reason for including the 2 acute cases in this group is that the axial leads had returned so far toward normal as to be much less diagnostic than was the chest lead. The commonest finding was an upright T wave in Lead 4 in 5 cases, 2 of which had an upright Q wave. In 1 case there was a high origin of the S-T segment. The Q wave was absent in 2 cases, 1 of which was associated with an early inversion of the T wave. These findings indicate that the T-wave changes persist longer than do the abnormalities of the Q wave, however, there were cases showing that this is not necessarily true.

Three of the Group II cases showed abnormali-

ties in Lead 4 in the presence of essentially negative conventional leads, in tracings taken eight, twenty and thirty days after the acute coronary occlusion.

There were 2 cases which showed points of interest and importance. The electrocardiogram of the first patient showed normal conventional and chest leads two years after a coronary occlusion, despite the autopsy finding of an old myocardial area of infarction involving the interventricular septum and an area of the left ventricle in the region of the apex. The other patient had been suffering from angina, caused by the slightest exertion and lasting for unusually long periods. After several weeks an electrocardiogram was made and a definitely abnormal Lead 4 was found. Eight days later he showed definite clinical evidence of an acute coronary occlusion with a fall in blood pressure, pericardial friction rub and collapse. Ap-

parently he had been suffering from an impending coronary thrombosis or myocardial anoxemia, the only definite evidence of which was shown in the high origin of a very tall T wave in Lead 4

CONCLUSIONS

Serial three-lead electrocardiograms, taken during the course of acute coronary closure, will in almost every case furnish adequate diagnostic evidence of the disease. If, as is often true in non-hospitalized patients or in patients who have recovered from an acute attack, a single electrocardiogram must be relied upon for a definite diag-

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3. Wolfarth, C. C. and Wood F C. The electrocardiographic diagnosis of coronary occlusion by the use of chest leads. *Am. J. M.* 183:30-35 1932.
4. Roth L. R. On the use of chest leads in clinical electrocardiography. *Am. Heart J.* 10:798-829 1935.

CASE REPORTS

Case 1 M E, a 54-year-old woman, gave a history of dyspnea on exertion for many years. Five months before admission on January 18, 1935, she began having pressure in her chest and numbness in the left arm, caused by exertion and relieved by rest. Three days before admission she had a similar pain, which persisted. Physical examination showed marked gallop rhythm, cardiac en-

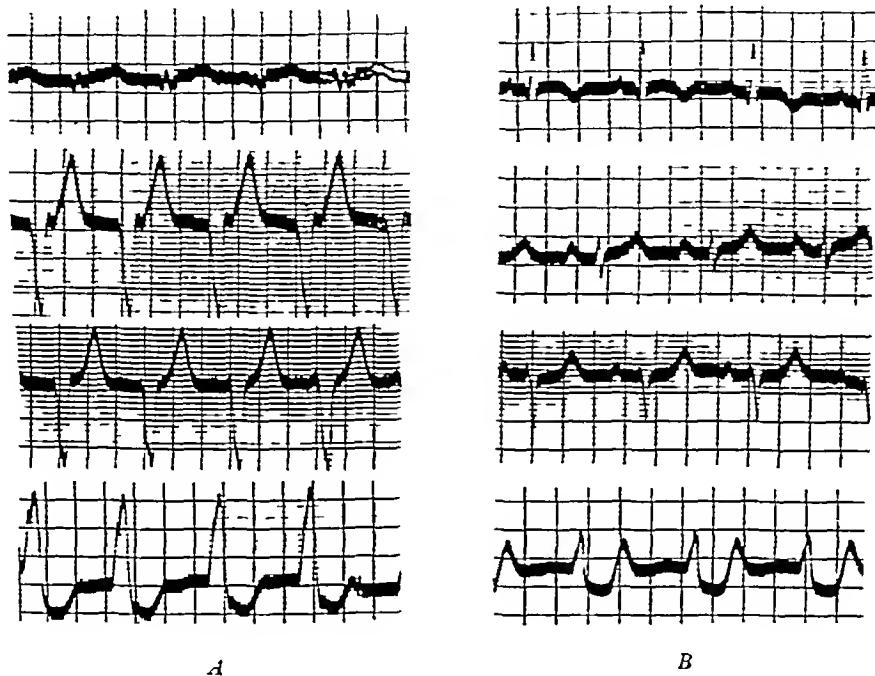


Figure 3 Case 2
A Twelve hours after occlusion
B Two days after occlusion

nosis, the evidence from the limb-lead electrocardiograms is likely to be equivocal. Our figures indicate that in nearly 20 per cent of an unselected group of cases with old and fresh infarcts the direct lead from the cardiac apex greatly increased the specificity of the electrocardiographic information. This information is thus immediate. It is confirmatory of the clinical story, and is often of primary value in treatment and prognosis. Inasmuch as the evidence from Lead 4 may precede that from the limb leads or may persist after the latter has disappeared, the precordial lead should be routinely taken in all cases of coronary disease.

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largement, no murmurs or evidence of congestive failure and a blood pressure 140/85. Her temperature was 103 F and the white-cell count was 16,400. After 6 weeks observation she was sent back to her doctor improved.

Figure 2A shows that six days after coronary occlusion the axial leads showed only low voltage as an abnormal finding. Lead 4, however, distinctly displayed the diagnostic evidence of anterior cardiac infarction through the displacement of the S-T segment and absent Q wave. The tracing taken fourteen days after the thrombosis (Fig 2B) finally confirms Lead 4 by showing the characteristic inversion of the T wave in Lead 1.

Case 2 J H, a 56-year-old man had been in good health until 3 weeks before admission to the hospital when he complained of tight low substernal pain, caused by walking and relieved by rest. Eight hours before his admission on April 6, 1937, he was awakened with severe constant low substernal pain, weakness, dizziness and sweating. His temperature was 101 F. There were no

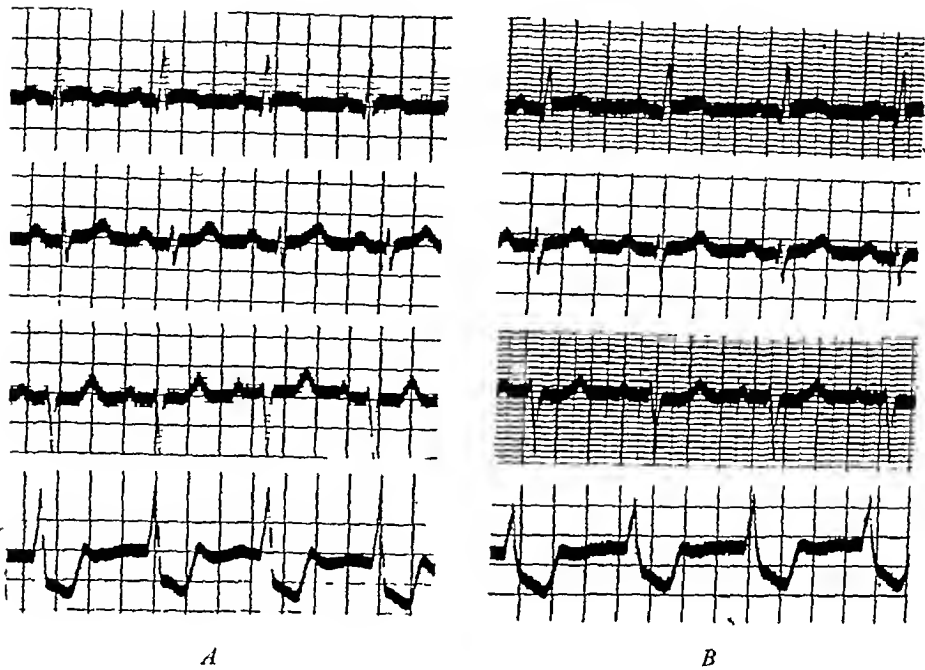


Figure 4 Case 2

A Three days after occlusion

B Eight days after occlusion

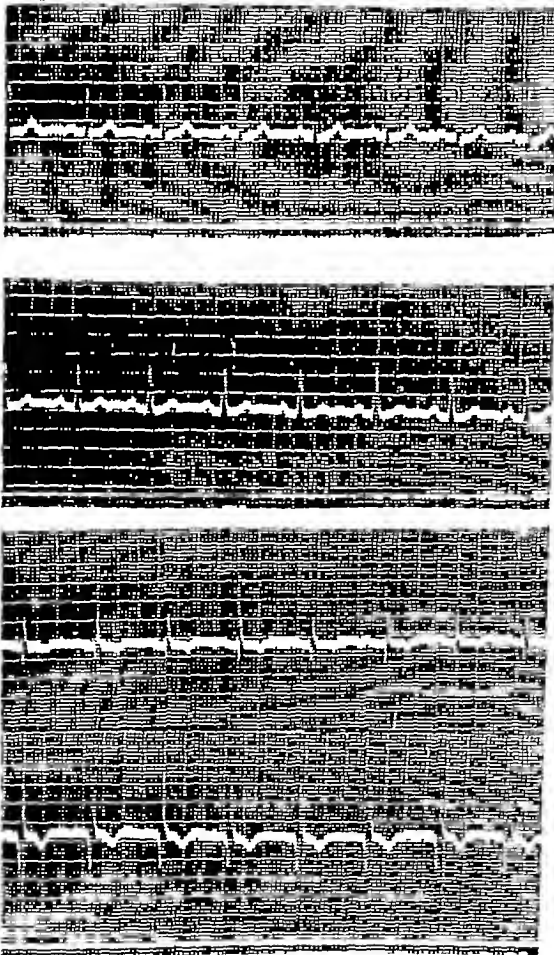


Figure 5 Case 3 Eighteen days before occlusion

murmurs or congestive failure. The blood pressure on admission was 180/100, but in a few hours it fell to 120/78. The white-cell count was 14,000. After 3 weeks he was discharged to his family physician.

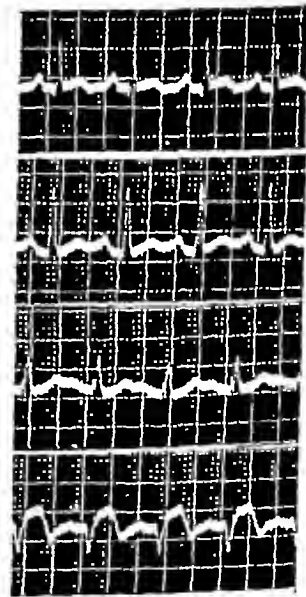


Figure 6 Case 3 Forty-one hours after occlusion. This Lead 4 was made by the new technic, in which the left-leg electrode is placed over the apex of the heart and the indifferent electrode on the left arm.

In Figure 3A all four leads are abnormal, but the diagnostic elements, so far as acute occlusion is concerned, are hidden by the bundle branch block. However, Lead 4 is quite suggestive of anterior infarct. In two days (Fig 3B) this was clear in both standard and chest leads.

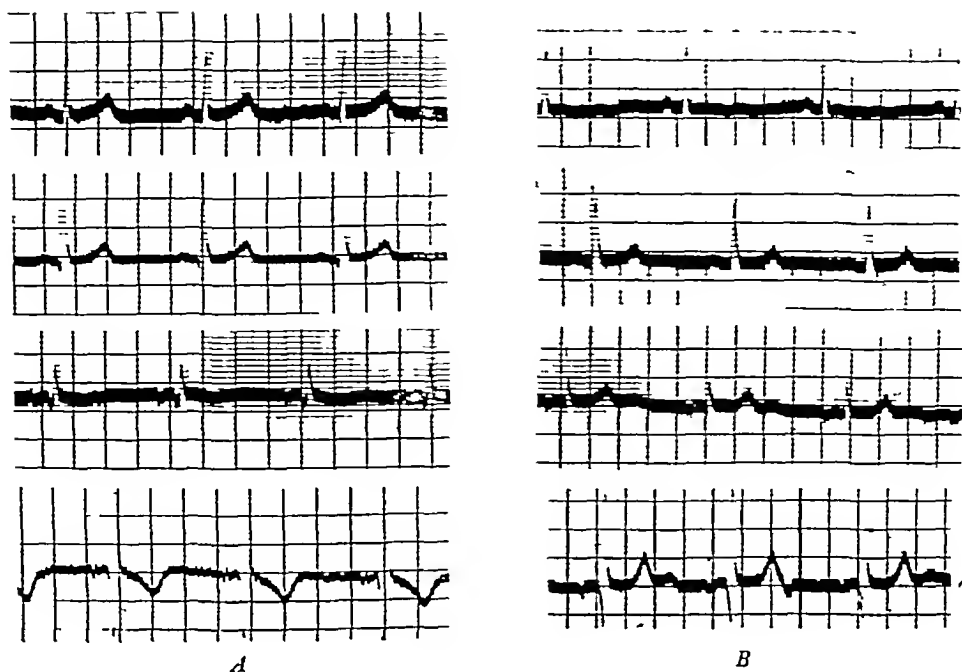


Figure 7 Case 4

A One year before occlusion

B Twelve hours after occlusion

In the tracings taken three and eight days after the occlusion (Fig 4A and 4B) the standard leads, while suspicious as to Lead I, do not give the clear information of Lead 4, with its persistent abnormalities in S-T and Q phases.

Case 3 A. H., a 55-year-old man, was well until Sep-

tember 11, 1937, on that day while watching a tennis match he felt an oppression in his chest. An electrocardiogram taken shortly afterward was normal. During the next month, however, he had more chest pain on exertion, which was relieved by nitroglycerin. On September 30

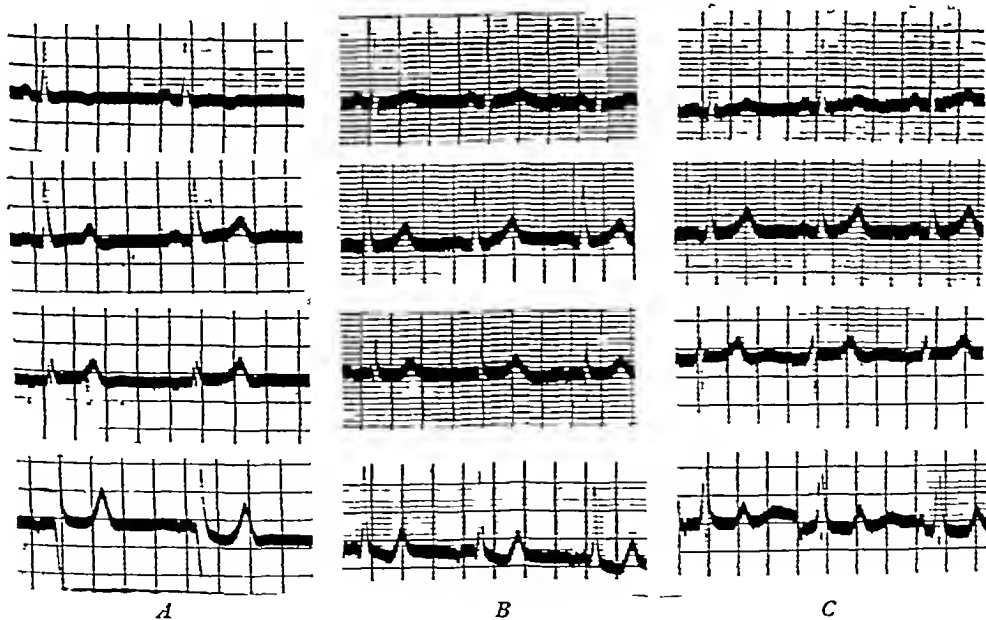


Figure 8 Case 4

A Six days after occlusion

B Twenty days after occlusion the conventional leads having returned to normal

C Five weeks after occlusion

after dinner he had a severe burning pain over the sternum, radiating down both arms. His blood pressure fell from 140/80 to 100/60. His pulse, which was 80 at first, rose to 104 and the temperature to 100.4°F 2 days later.

An electrocardiogram taken September 12, 1937 (Fig 5), shows no abnormality in any of the complexes except a very slight slurring of the QRS in Lead 2. The tracing taken on October 2 (Fig 6), forty-one hours after the onset of the occlusion, shows a suspicious elevation of the S-T segment in Lead 1, but an entirely characteristic picture of anterior occlusion in Lead 4. It should be noted that Lead 4 was taken with the more recent technic, and therefore has a reversed polarity as compared with the others here shown.

Case 4 J. K., a 36-year-old man, entered the hospital on April 7, 1937, complaining of dyspnea and precordial pressure on exertion, following a severe chest pain 2 years previously, associated with pain in the left arm. On the day before admission he was awakened by a severe chest pain, with radiation into the left arm, which lasted for 1 hour. His temperature was 100°F. The white-cell count was 8800, the blood pressure was 135/80, and the heart sounds were of good quality. A 7-foot heart plate showed the heart to be at the upper limits of normal size. A blood Hinton test was negative. After 4 weeks the patient was discharged to his home, where he was comfortable except for precordial pain on exertion. On June 10, 1937, he started to seek employment, but had to give up because of chest pain. After that time he had frequent, severe chest pains, and on June 13, 1937, he came to the Emergency Ward with the most severe pain he had yet experienced, with radiation into the left arm and the jaw. The heart sounds were distant, the blood pressure was 110/90,

and the white-cell count was 10,000. He died suddenly the next morning.

Postmortem showed that the heart weighed 325 gm. Along the lower half of the interventricular septum and somewhat involving the anterior portion of the left ventricle at the apex, the myocardium and endocardium were dull steel-blue in color and somewhat thin. The main coronaries showed marked yellowish atheromas. Three millimeters beyond the descending branch of the left coronary there was an old occlusion. Five millimeters beyond the origin of the circumflex branch of the left coronary the artery was almost occluded, and 1 cm. farther along the closure was complete. The right main coronary artery showed recent occlusion.

Figure 7A cannot be considered diagnostic of coronary occlusion, in spite of the findings at autopsy indicating that an infarction of the apical and septal region of the heart had taken place one year before. Twelve hours after the second occlusion (Fig 7B) Lead 1 was very suspicious, especially so when compared with an electrocardiogram taken on March 16. Moreover, the slightly inverted T wave in Lead 3 of the previous tracing had become upright, conforming to the pattern of anterior occlusion. Lead 4, however, showed the most marked change in the T wave direction. Figures 8A, 8B and 8C are interesting as showing the return of the standard leads to normal, except for a slight left-axis deviation and a persistent abnormality in Lead 4. In this case a standard three lead electrocardiogram taken only 20 days after an acute coronary thrombosis, and 2 years after another, was within normal limits, and the diagnostic features were confined to the direct chest lead.

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THE SIGNIFICANCE OF THE WEAKLY POSITIVE ASCHHEIM-ZONDEK TEST

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IN THE routine Aschheim-Zondek tests for pregnancy as performed at the Boston City Hospital, the reports fall into three groups: positive, weakly positive, and negative. All tests are read by examining, microscopically, stained sections of the rats' ovaries. In the definitely positive and negative tests there is no doubt about the interpretation in our minds or in those of the patients' physicians. In the weakly positive cases, however, there is often uncertainty in the minds of all concerned, and we are asked whether the patient is pregnant. In order to clear up this confusion, we have followed through to a definite diagnosis 60 cases in which the report was weakly positive. In all the cases of miscarriage such a diagnosis was evident, either from gross observation or from microscopic sections of placental tissue. In all the other cases the diagnosis was confirmed by microscopic sections. The cases were without exception taken from the gynecological and obstetrical service of the Boston City Hospital. Many of them were observed and cared for by one (B. T.) of us.

In a positive test, we must remember, the immature female rat's ovaries respond either to two separate hormones or to one pituitary hormone in two different ways. The present weight of opinion is that there is a pituitary follicle-stimulating hormone as well as a pituitary luteinizing hormone. The first causes the growth of the ovarian follicles, and must be present before the luteinizing hormone can change the ripe follicle into a corpus luteum. In addition to these pituitary hormones there is the prolactin which is found in pregnancy urine. It also causes the formation of corpora lutea in the immature rat ovary. This pregnancy-urine prolactin is thought to be of placental origin, although it is so similar to the luteinizing hormone of the pituitary that its separate entity is not a certainty. It is this prolactin that gives the positive Aschheim-Zondek test.

In the first two or three weeks following conception, injection of urine gives only a follicle-stimulating effect in immature rats. In other words, there is follicle growth without formation of corpora lutea. This is due either to the presence of the pituitary hormone or to the follicle-stimulating effect of a very small amount of pregnancy prolactin.

While this result cannot be read as a positive Aschheim-Zondek test, it is extremely suggestive of pregnancy if the patient is only a few days past her period. Following this early phase, enough pregnancy prolactin is present in the urine to produce definite corpora lutea in the immature rat. There is an intermediate stage between the two extremes in which follicle growth is stimulated and there is luteinization of the follicle cells without the formation of a distinct corpus luteum. This is the weakly positive test. The same cycle is reversed when a fetus dies. Such a pregnancy may first have given a definitely positive test. As the trophoblast of the placenta degenerates the hormone diminishes, resulting in a weakly positive test. Thereafter the minute amount of prolactin gives only a follicle-stimulating effect, and finally the test becomes negative.

It can thus be seen that in very early pregnancy a weakly positive test is the normal finding. In a woman with a twenty-eight-day menstrual cycle, the Aschheim-Zondek test when made six weeks from her last regular period should be definitely positive in a healthy pregnancy. The cases considered in this paper are those of women who were more than two weeks overdue and so would have been expected to have had positive tests.

In several cases that have shown a weakly positive test we have concentrated the urine and obtained a definitely positive result. These turned out to be abnormal pregnancies, however. Concentration is therefore of no value in this type of work. If a patient does not have enough prolactin to give a positive test with whole-urine injection, she has either a very early or a pathologic pregnancy.

Table 1 Final Diagnosis in 60 Cases Showing a Weakly Positive Aschheim Zondek Test

DIAGNOSES	NO. OF CASES
Miscarriage	38
Tubal pregnancy	12
Dead fetus	5
Hyperplasia of endometrium	2
Tubo-ovarian mass	2
Hydatid mole	1
Normal pregnancy	0

The relative occurrence rates of miscarriage and of tubal pregnancy in Table 1 are of no significance, because the usual miscarriage prevents no diagnostic difficulty and does not receive an Aschheim-Zondek test.

One fact stands out prominently in our final statistics: no patient with a weakly positive test had

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a normal pregnancy. This in itself is of value in the treatment of threatened miscarriage. As such cases are apt to occur in the second and third months of pregnancy, a positive test at this time gives a good prognosis, while a weakly positive test gives a practically hopeless one.

From the miscarriages recorded here, and the great number that might be added were they tested, it is evident that with a weakly positive test the first probability is that one is dealing with a blighted ovum, or an unhealthy pregnancy which will terminate in a miscarriage. We see many patients with staining in the second and third months of pregnancy. We feel that in these cases an Aschheim-Zondek test is of prognostic value.

The next most important finding is the relatively large number of cases with weakly positive tests that proved to be tubal pregnancies. One would expect this when one considers the lesion of tubal pregnancy. The ovum is implanted in an abnormal and unhealthy environment, and its normal growth is impaired. Few tubal pregnancies continue very long without damage to the ovum, which soon loses its vitality, the physiologic secretion of the cells accordingly becoming less. Fortunately, in most cases local symptoms which suggest the diagnosis are present. While on the laws of chance a weakly positive test points to a poor intrauterine pregnancy, it can be seen from this series that tubal pregnancy is of sufficient frequency to require that it be carefully ruled out. As we all know, one of the dangers of tubal pregnancy is that the condition is so rare that the diagnosis is unlikely to enter the physician's mind. This test definitely suggests it as a possibility.

The 5 cases with dead fetuses could strictly speaking be classed as miscarriages. Four of these were in the last trimester. The test is of additional evidence in such cases, but is probably unnecessary for diagnostic purposes.

The weakly positive tests in the 4 nonpregnant cases, 2 of hyperplasia of the endometrium and 2 of tubo-ovarian abscess, are difficult to explain. We do know that estrogenic hormones are the essential cause of endometrial hyperplasia. This may

be the result of an excess of the follicle-stimulating hormone of the pituitary. Furthermore, in the cases of tubo-ovarian masses where the ovary had been destroyed there may have been some castration effect on the pituitary. These 4 cases therefore suggest that the positive reactions were due to the presence of gonadotropic hormones of the pituitary.

The single case of hydatid mole is of interest in that the weakly positive test fits in with our findings in 2 cases of early chorioepithelioma. In these we found less hormone than is encountered in normal early pregnancy. This shows that while an extremely high hormone content of the urine is present in well-advanced cases of hydatid mole and chorioepithelioma, it is not present in the early stages. For the sake of the patient the diagnosis should be made, if possible, when the hormone is present in only small amounts.

SUMMARY AND CONCLUSIONS

Sixty cases that showed a weakly positive Aschheim-Zondek test for pregnancy have been followed to a definite diagnosis. None were included in which the last period was less than two weeks overdue. Cases up to eight months' pregnancy were included. In this series the majority of patients miscarried. In a relatively large number tubal pregnancy was found at operation. Four cases gave diagnoses other than pregnancy, and thus suggested the presence of abnormal amounts of pituitary hormones. No patient had a normal pregnancy.

From this it seems likely that after the first few weeks of pregnancy a weakly positive Aschheim-Zondek test indicates some abnormality. A miscarriage following an unhealthy pregnancy is the commonest sequela, and a weakly positive test with a clinical diagnosis of threatened miscarriage indicates a poor prognosis. Tubal pregnancy must always be carefully considered as a diagnostic possibility in this type of test.

A weakly positive Aschheim-Zondek test may be of as much value as a positive or negative one.

NEUROLOGIC MANIFESTATIONS OF SUBACUTE BACTERIAL ENDOCARDITIS

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THE central nervous system is frequently involved in the course of many well-known diseases in which the primary pathologic process is far removed from the brain. One such disease, subacute bacterial endocarditis, has a high incidence of neurological symptoms, and since these symptoms are not infrequently the first to occur, they may lead to the impression that the primary lesion is in the nervous system, and hinder rather than aid in arriving at the correct diagnosis. It is the purpose of this paper, first, to present 3 cases which gave us considerable difficulty in diagnosis, and secondly, to emphasize the significance of central-nervous-system manifestations in the early recognition of subacute bacterial endocarditis, as determined by an analysis of 100 proved cases admitted to the Boston City Hospital in the last twelve years.

Thayer¹ states in his monograph on bacterial endocarditis that occlusion of the larger cerebral vessels, or, more rarely, rupture of mycotic aneurysms with subsequent hemiplegia, is distressingly common. The former was present in 31 per cent of his 145 cases. Klemmer² reported a series of 6 cases which presented multiple neurological findings. Symptoms referable to the nervous system were observed in 25 per cent of DeJong's³ cases. Blumer⁴ found that headache was the commonest symptom, and that this was closely followed by vertigo, tinnitus, insomnia, irritability, extreme nervousness, delirium, somnolence, coma and convulsions, cerebral embolism was the cause of death in 44 out of 193 cases. Osler⁵ reported 3 deaths from this cause out of a series of 10 cases.

CASE REPORTS

Case 1. A 27-year-old white man was admitted complaining of severe headache, blurring of vision, deafness in the left ear and muscular weakness on the left side. Three months before admission the patient had headache and malaise, accompanied by fever. Transient attacks of slurred speech were noted. These episodes were followed in short order by a siege of migratory arthritis, which periodically confined him to bed. He had had a cough productive of mucus for several months preceding admission, and had lost 20 lb. during his illness. Ten days before admission the right-sided headache became more severe, followed by drowsiness, blurring of vision, numbness of the left side and difficulty in using the left arm and leg.

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The past history was noncontributory except for an attack of acute rheumatic fever at the age of 14.

On physical examination the patient did not appear acutely ill. The temperature was 99°F, the pulse 100, and the respirations 20. The heart was not enlarged to percussion, and the rate and rhythm were normal. The second mitral sound was split, but no murmurs were heard. The blood pressure was 140/75. The nasal margins of the optic disks were obscured, and in the macular region of the left fundus there was a dull red area a few millimeters in diameter. No definite weakness on the left side could be demonstrated, but there were hypalgesia and hypesthesia of the skin on the left side. The deep reflexes were active and equal, and the plantar responses were normal. The abdominal and cremasteric reflexes were absent. There was difficulty in recalling words and dates and a definite tardiness of responses, but no actual aphasia.

Examination of the urine showed a very slight trace of albumin, from 4 to 6 white blood cells per high power field and an occasional granular cast. The hemoglobin was 73 per cent (Sahli), the red blood-cell count was 3,950,000 and the white-cell count 12,000. An x-ray of the chest and skull and an electrocardiogram were normal. The spinal fluid was under an initial pressure of 140 mm. of water. The fluid was clear and slightly yellow, and contained 200 cells per cu. mm. The globulin test was positive, the protein content was 84 mg., the sugar content 48 mg. and the chloride content 693 mg. per cent. The colloidal gold and Wassermann tests were negative.

During the first weeks stay in the hospital there was no particular change in the patient's condition. The temperature remained normal. Re-examination after transfer to the neurological service 1 week after admission showed findings similar to those on admission, except that the heart seemed to be enlarged. The first sound at the apex was muffled, and a soft, systolic, non-transmitted murmur was heard in that area. The second pulmonic sound was accentuated. A small, blue-black, pea-sized and tender subcutaneous nodule was present in the left trochanter region. The patient complained of severe right-sided headache, accentuated on motion of the head. Marked tenderness to percussion was present in the right temporoparietal region. He was unable to read newspaper print at a distance of 35 cm. The margins of the optic disks were blurred and the nerve head appeared to be swollen. There was a slight paresis of the left external rectus muscle. The visual fields were normal. The weakness of the left side which the patient complained of on admission had developed into a definite left hemiparesis, with hemihypesthesia, atopognosis and astereognosis on the same side. A mixed type of aphasia involving both sensory and motor components was evident. The patient was originally left-handed but had been taught to write with his right hand. The deep reflexes were slightly more active on the left.

Re-examination of the spinal fluid at this time showed that it was under a pressure of 160 mm. of water. The fluid was clear and colorless and contained 48 cells per cu. mm. The globulin (Pandy) test was positive. The

protein content was 42 mg, sugar 53 mg and chlorides 730 mg per cent. Colloidal gold and Wassermann tests were again negative.

The difficulty in speaking became progressively worse, and the cardiac signs became more evident. Three weeks after admission there were definite physical signs of mitral and aortic valvular disease. The temperature was now of a picket fence type, ranging between 100 and 103°F, with a corresponding tachycardia. Petechiae appeared in the left conjunctival sac and in the skin of the right wrist and abdomen. Blood culture, taken a few days before the appearance of the petechiae, was positive for *Streptococcus viridans*. The hemoglobin dropped from 72 to 48 per cent (Sahli), and the erythrocyte count from 3,950,000 to 2,770,000. The patient died 8 weeks after admission. Permission for an autopsy was refused.

The diagnosis was made difficult in this case by several factors. First, the development of the hemiparesis and aphasia was apparently of slow evolution, suggesting the expansion of a neoplasm. The changes that developed in the appearance of the optic nerve supported this diagnosis. Secondly, the temperature did not become elevated until a week after admission. Thirdly, sufficient attention was not paid to the history of the old rheumatic fever and the more recent "arthritis." Finally, the cardiac signs were not diagnostic on admission, and petechiae were not seen until almost three weeks afterward. The diagnosis was established by blood culture when the cardiac signs became evident.

Case 2 A 34 year-old, colored man was admitted with a history of a sudden onset of right hemiplegia and speech disturbance. A week before admission, while drinking a glass of soda water, the patient suddenly began to perspire profusely, felt faint and 'shook violently.' He thought he was going to die, and was aware that he could not speak or move the right side of his body. He was carried home, and was brought to the hospital 1 week later because there was no improvement.

One year before admission the patient suffered from occasional dizzy spells and was treated for high blood pressure. A few months later his eyes began to pain and burn, and he was unable to read fine print. At the same time, vague aches and pains were present in his joints and muscles. Night sweats were frequent, and because of loss of weight, general malaise and lassitude it became necessary for him to stop working.

When 14 years old he had had severe joint pains, with episodes of chills and fever lasting several weeks. Other wise the past history was noncontributory.

Physical examination revealed a well-developed and well-nourished man. The temperature was 102°F, the pulse 98 and the respirations 22. The patient was conscious and co-operative, but appeared confused and disoriented and had difficulty in speaking. The heart was enlarged on the left. The rate, rhythm and quality of heart sounds were normal. Presystolic and systolic murmurs were heard at the apex. The blood pressure was 136/100. There was no evidence of cardiac decompensation. There were a complete right hemiparesis and a mixed type of aphasia, with both motor and sensory components. The deep tendon reflexes were exaggerated, being more active on the right. Ankle clonus was elicited on the right. The abdominal and cremasteric reflexes were absent but

no pathologic reflexes were obtained. The gait showed shuffling of the right foot and staggering toward the right.

Examination of the urine on numerous occasions yielded a slight trace of albumin and a few hyaline casts. Blood studies showed a hemoglobin of 73 per cent (Sahli), the erythrocyte count averaged 3,750,000 and the white-cell count was 18,000. A blood Hinton test was negative. The spinal fluid was under an initial pressure of 250 mm of water. The fluid was clear and colorless and contained 38 lymphocytes per cu mm. The globulin test was negative and the protein content was 36 mg per cent. Colloidal gold and Wassermann tests were negative. A second examination of the cerebrospinal fluid was made several days later, and the findings were the same as on previous examination except that the pressure was 170 mm. Blood cultures were positive for *Streptococcus viridans*.

There was no marked change in the patient's condition during his 3 weeks' stay in the hospital. There was intermittent fever, a few petechiae were observed in the right conjunctiva and fundus 5 days after admission, and the spleen became palpable. The patient was transferred to a state institution, where he died 4 months later. No autopsy was performed.

Because of experience with the preceding case, the diagnosis in this one was made promptly after admission to the hospital. The past history of rheumatic fever, the acuteness of the onset of symptoms and the localization of signs, reinforced by a positive blood culture for *Streptococcus viridans*, left no doubt as to the diagnosis. Syphilitic endarteritis was excluded by the negative serological tests on both the blood and spinal fluid.

Case 3 A 45 year-old, colored man was admitted complaining of double vision and generalized weakness following the extraction of a tooth. He was confused, disoriented, and hallucinated in the visual and auditory spheres.

The patient had enjoyed good health until 4 days before admission, when a few hours after the extraction of an abscessed tooth he felt generalized weakness. Three days later he was unable to walk, falling on two occasions and injuring his right shoulder. Difficulty in vision appeared 36 hours after the initial weakness, and grew steadily worse necessitating admission to the hospital.

In the past history it was noted that the patient had had a chancre of the penis 15 years before and had received some treatment. He suffered from convulsions until 10 years of age. No history of rheumatic fever or joint pains could be obtained.

Physical examination revealed a well-developed and well-nourished man who was excited, overtalkative and confused, with alternating periods of rational behavior. At times he sang, tried to get out of bed and struggled at the restraints. He realized that he was in a hospital, but did not know in which one. The temperature was 100°F, the pulse 96, and the respirations 28. The pupils were fixed to light and accommodation. A divergent strabismus was present. The eyes were able to follow a finger on downward gaze and to a very slight extent on upward gaze. No motion was present in any other direction. There was ptosis of both upper lids, more marked on the left, with flattening of the left nasolabial fold. The fundi were negative. The heart was enlarged on the left and right. There was a loud aortic systolic murmur which was transmitted upward to the neck, and a diastolic murmur which was heard best to the left of the midline. A double mur-

mur was heard over the mitral area. The blood pressure was 118/74. The speech was nasal in character, and the masseter muscles were weak. There was a generalized weakness of all muscles, but the greatest involvement was present in the lower extremities. The right deep-tendon reflexes were slightly more active than on the left side. There were bilateral Babinskis.

Examination of the urine showed a slight trace of albumin, occasional clumps of white blood cells, and rare hyalin and granular casts. Blood examination showed a hemoglobin of 84 per cent (Sahli), a red-blood-cell count of 4,510,000, and a white-cell count between 6650 and 17,500. A blood Hinton reaction was positive, and a blood culture was negative. An x-ray of the chest showed fluid at the left base. The spinal fluid was under an initial pressure of 180 mm. of water. The fluid was clear and colorless and contained 15 cells per cu mm. The protein content was 30 mg. per cent, and colloidal gold and Wassermann reactions were negative.

The temperature, which had ranged between 99 and 101°F on admission, rapidly became septic in type, varying between 100 and 105°F. The pulse was 120 and the respirations 30. No petechiae were seen. Dullness, increased breath sounds and moist rales were present at both bases posteriorly. Another blood culture was negative. The pupillary reactions, at first absent, returned later, otherwise there was little change in the neurologic status. During the last week of illness frequent bouts of profuse sweating accompanied by psychomotor hyperactivity occurred. Between these episodes the patient appeared rational and co-operative. He died suddenly 4 weeks after admission.

The necropsy was performed 15 hours post mortem by Dr. D. R. Wier of the Mallory Institute of Pathology. The heart weighed 500 gm. There was marked thickening and stenosis of the mitral and aortic valves. The chordae tendineae were thickened and shortened. An adherent, firm, mural thrombus extended through the mitral valve, and adhered to the adjoining endocardium of the left ventricle. On the surface of this thrombus was a small amount of formed blood clot. The convolutions of the brain were narrowed and the sulci widened. On cut section, sharply demarcated areas of necrosis were present in the right substantia nigra (0.5 by 0.2 cm.) and in the posterior part of the right quadrangular lobe of the cerebellum (2.7 by 0.8 cm.), the latter was yellow red and confined to the cortical ribbon. Similar infarcts were present in the anterior part of the vermis and in the pons.

Microscopic examination of the heart showed marked degeneration of the muscle bundles. The valves were thickened by dense hyalin tissue and infiltrated by a few lymphocytes and mononuclear cells. No bacteria were seen in sections stained by the MacCallum-Goodpasture method. Microscopic examination of the brain showed the following: The right substantia nigra disclosed an area in which the normal architecture was completely destroyed and which was diffusely infiltrated by fat-laden macrophages. At the boundary of the lesion were a large number of pigment-bearing macrophages. Similar areas were seen in the left substantia nigra and in the pons. An older lesion made up of many fatty macrophages interlaced by glial cells was present in the pons. The cerebellar sections revealed an area of softening 1.6 by 9 mm. The cortical ribbon was completely broken down and replaced by fat-laden macrophages. The supporting white matter showed ischemic necrosis. This lesion was bordered by several smaller ones in which glial proliferation could be seen. The medulla oblongata was normal.

This patient presented a diagnostic problem which was not solved even at the time of death. The difficulty in this case arose from the rapidity of evolution, the multiplicity of signs of involvement of the brain stem, the history of a chancre and a positive blood Hinton reaction, and negative blood cultures. Diagnoses of epidemic encephalitis and of syphilitic meningoencephalitis were entertained. Neither could be substantiated. The bizarre nature of the clinical picture did not suggest subacute bacterial endocarditis, but recapitulation brings out many similarities between this and the previous cases. The onset of symptoms coming so abruptly after the extraction of an abscessed tooth was of great significance. Although this case was not proved by the requisite criteria, it has been included because of its startling similarity.

STATISTICAL DATA

The total admissions to the Boston City Hospital between the years 1924 and 1937 numbered 385,397. In this period the diagnosis of subacute bacterial endocarditis was made in 267 cases but on critical analysis it could be thoroughly substantiated by generally accepted criteria in only 100 cases. This diagnosis was considered established beyond any reasonable doubt if a positive blood culture of *Streptococcus viridans* was obtained, or if this organism had been demonstrated in the fresh valvular vegetations on postmortem examination. These are essentially the criteria suggested by Davis and Weiss.⁶ They were the basis for the diagnosis in the 100 cases which constitute this series. The average age was 31.8 years, and the ratio of males to females was 57:43.

Thirty-one per cent of the cases were admitted to the hospital with one or more neurologic manifestations. In most of the cases these led to erroneous diagnoses, such as Schilder's disease, anterior poliomyelitis, cardiac psychosis, scurvy, polyneuritis, mycotic cerebral aneurysm with rupture, cerebral hemorrhage, encephalitis lethargica, central-nervous-system syphilis, brain tumor and tuberculoma. In most cases the correct diagnosis was made late in the course of the disease. Seven cases were diagnosed at necropsy examination and clinically were thought not to be instances of subacute bacterial endocarditis.

Definite signs of involvement of the central nervous system were present in 31 per cent of the patients on admission. In 20 per cent the symptoms and signs were so predominantly neurologic that the primary lesion was thought to be in the central nervous system.

The frequency of the various symptoms and signs referable to the central nervous system is shown in Table 1. It will be seen that headache, speech

difficulty, vomiting, drowsiness, coma and dizziness were the most frequent symptoms, occurring in from 15 to 24 per cent of the cases. Confusion, delirium, visual symptoms, restlessness, nervousness, irritability, irrationality, convulsions and emo-

one side to absence of deep reflexes. Seven per cent showed a positive Kernig sign. Subarachnoid hemorrhages were found in 2 patients on admission, and an intracerebral hemorrhage was present in 6.

Table 1 *Incidence of Neurologic Symptoms and Signs in 100 Proved Cases of Subacute Bacterial Endocarditis*

Symptoms	PERCENTAGE OF CASES	Signs	PERCENTAGE OF CASES
Headache	24	Hemiplegia or hemiparesis	31
Speech difficulty	19	Cranial nerve palsies	25
Vomiting	18	Reflex changes	22
Dizziness	17	Hemorrhages in ocular fundi	22
Coma	17	Choked disks	8
Drowsiness	15	Positive Kernig	7
Confusion	10	Clonus	5
Visual difficulty	10	Positive Babinski	4
Delirium	6	Tremors in extremities	2
Restlessness			
Irritability			
Irrationality			
Convulsions	5		
Nervousness			
Emotional disturbance	2		
Hiccough	1		
Hearing difficulty			

tional disturbances were the next most frequent symptoms, being reported in from 5 to 10 per cent. Two cases of intractable hiccough occurred, and 1 patient complained of loss of hearing. These statistics are in agreement with those of Blumer,⁴ previously cited.

Hemiplegia or hemiparesis and cranial-nerve paralysis were the most frequent neurologic signs, occurring in 31 and 25 per cent, respectively. Many of the cases of cranial-nerve paralysis should be excluded because they consisted of facial paralysis accompanying a hemiplegia. In a few instances there was a ptosis or a hypoglossal paralysis. Choked disks were observed in 8 patients, and hemorrhages in the fundi in 22. Sixteen cases presented hemiplegia on admission. The reflex changes varied from an exaggeration of reflexes on

SUMMARY AND CONCLUSIONS

Two certain and 1 unproved case of subacute bacterial endocarditis with neurologic signs, which offered considerable diagnostic difficulty, are reported.

Thirty-one per cent of the 100 patients with subacute bacterial endocarditis admitted to the Boston City Hospital between 1924 and 1936 showed one or more neurologic manifestations on admission. In 20 per cent the symptoms and signs were so predominantly neurologic that the primary lesion was thought to be in the central nervous system.

Subacute bacterial endocarditis should be kept in mind as a diagnostic possibility when a young adult is admitted to the hospital complaining of drowsiness, severe headache, double vision, impairment of speech or sudden loss of consciousness, particularly when he shows cranial-nerve palsies or a hemiplegia. These neurologic manifestations may be the earliest evidence of the existence of subacute bacterial endocarditis. Careful examination of the heart and repeated blood cultures will prevent errors in diagnosis.

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CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITALANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24131

PRESENTATION OF CASE

A forty-seven-year-old Italian fruit dealer entered the hospital with the complaint of chronic cough.

As a young man he had malaria over a period of about six years, and during that time he first began to cough. He coughed daily for the thirty years before entry. At the time of entry he had spells of coughing when he rose in the morning, after his lunch and supper and at night. He raised a total of more than a cupful of thick, yellow non-odorous sputum daily. He thought that the sputum had increased in amount during the five years before entry. He had occasional night sweats but no chest pain, hemoptysis, continued fever or other cardiorespiratory symptoms, except slight dyspnea on mild exertion. He thought that at about the age of five he had empyema in the right chest which was operated on and drained for a month.

Twenty years before entry he had influenza, "double pneumonia" and typhoid fever. He did not remember what childhood diseases he had had. He had had frequent colds and occasional epistaxis after blowing his nose. He had not lost any weight. His past history was otherwise negative, and his family history was not contributory.

Physical examination revealed a well-developed and nourished Italian appearing to be in excellent health. There was an operative scar 1 cm above the right nipple. His heart was negative, and the blood pressure was 140 systolic, 80 diastolic. The lungs showed no dullness to percussion. At the right base and in the lower part of the right axilla many coarse moist rales could be heard, without change in the breath sounds. However, in the left axilla between the left nipple and the left posterior axillary line similar moist rales could be heard, without other signs. The extreme bases of the lungs were clear. There was moderate clubbing of the fingers.

The temperature was 98°F., the pulse 85. The respirations were 20.

The urine showed the slightest possible trace of albumin. The blood showed a red-cell count of 4,770,000 with 85 per cent hemoglobin, and a white-cell count of 16,700 with 78 per cent polymorphonuclears. The sputum contained numerous pus cells

and a few diplococci, but no tubercle bacilli. The nonprotein nitrogen of the blood serum was 20 mg per cent, and a blood Hinton test was negative. An electrocardiogram showed slight left-axis deviation.

An x-ray of the chest revealed a sharply defined rounded area of density completely occupying the region of the right middle lobe. The left lung and the upper and lower lobes on the right were clear. The heart shadow was a little prominent in the region of the left ventricle. There were no mediastinal masses.

On the fourth day an operation was performed.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON. Here is the round mass that was described occupying the entire area of the middle lobe. The shadow looks larger and rounder than the middle lobe would ordinarily appear but it does not cross the interlobar fissures. It is apparently confined to the middle lobe. He has thickened pleura over the right apex and along the upper axillary line. His right diaphragm moved well except at its anterior portion. The diaphragm is relatively low on both sides. In this dense shadow you can see two or three areas of diminished density with horizontal lower borders which suggest small cavities with fluid levels. This is the upper margin of the mass, and if these shadows are cavities, then the wall of the mass is quite thin. Apparently it is a thin-walled fluid-containing mass. There is no evidence of metastatic cancer or enlarged nodes.

DIFFERENTIAL DIAGNOSIS

DR. JOHN W. CASS. The story of a forty-seven-year-old man with a cough of thirty years' duration means that the history may well be incomplete. It may have been difficult for the man to remember the onset of his illness, and incidents such as foreign-body inhalation or acute respiratory infection may have been forgotten. As a youngster over a period of six years he was supposed to have had malaria, and during that period he noticed cough. This was the first illness that he remembered much about. It may not be the true onset of the cough. However, he does remember that for a number of years, apparently thirty, the raising of sputum associated with this cough occurred chiefly in the morning, after meals or often at night, which means there was a cavity or several small cavities, the drainage of which was aided by intra-abdominal pressure changes. The sputum was thick and nonodorous. There is nothing particularly characteristic about that, though it indicates that the usual mouth spirochetes had not complicated the infection. He thought the spu-

tum had increased in amount. That is very indefinite and of no significance that I can see. He had occasional night sweats—an indication of infection—but no chest pain and no hemoptysis. The fact that he had no continued fever means, I presume, that the infection was fairly adequately drained. There were no cardiorespiratory symptoms except dyspnea, so the process was probably not extensive, and did not cut down the vital capacity or add any burden to the circulatory system. He had had empyema at the age of five, which drained for a month. This is important because an empyema can last this long, and if the raising of sputum and cough did not occur until many years after the original empyema, it is possible that a bronchial fistula developed many years after the original empyema.

The influenza and "double pneumonia" twenty years before entry are probably of no significance, since the underlying chronic lung infection may have made him more susceptible to other chest infections. He had had frequent colds but lost no weight, which means that the disease had been handled fairly adequately and that he had not suffered any great impairment of health. From the history there are many diagnoses suggested, namely bronchiectasis, tuberculosis, abscess, empyema with a bronchial fistula, unusual infection, such as is caused by yeasts or fungi, or even possibly a benign tumor.

On physical examination it was again mentioned that the patient was well-developed and nourished. He appeared in excellent health. There was an operative scar on the right side, evidently the area of drainage of the empyema. The blood pressure was 140 systolic, 60 diastolic, with a normal heart, which again means that the disease had not handicapped his circulatory system. The lungs showed no dullness, which is surprising, you would expect dullness from a localized area of disease that was capable of producing a cup of sputum.

"At the right base and in the lower part of the right axilla many coarse moist rales could be heard, without change in the breath sounds." So there is disease by physical examination on the right side, but on the left side there were similar rales. This is confusing. One would like to believe one was dealing with a more local process.

Clubbing of the fingers is usually indicative of congenital heart disease, which is absent in this case, or a suppurative lung condition. By physical examination we can demonstrate a lung condition, and the findings are more compatible with bronchiectasis than with the others mentioned. I attach no significance to the temperature, pulse and

respirations. He must have had fever from time to time, but with a chronic lung condition with fairly good drainage it is possible to have little or no fever.

The nonprotein nitrogen was normal. He probably had no real chronic nephritis. He perhaps had amyloid disease, which one does have to think of with a process of this duration. There is no Congo red test to help to make this diagnosis. I do not see how it can be made on the basis of the information at hand. The sputum shows nothing definite. No tubercle bacilli were seen and one would think they could be found easily in a process draining as freely as this. The blood Hinton test was negative, there is nothing to suggest a syphilitic process. The electrocardiogram seems to be compatible with the patient's age. The absence of right-axis deviation means that the process caused no great impairment to the pulmonary circulation.

From the laboratory work we cannot rule out any of the mentioned diagnoses. Lipiodol would be a great help in the diagnosis of bronchiectasis. Tuberculosis I think has been ruled out. I do not believe we are dealing with cancer, and we narrow the diagnosis down a bit. The x-ray gives us the first definite localization of this process, localizing it to the right middle lobe, particularly in the lateral film which is so important in middle lobe disease, as pointed out by Dr. Hampton. It does not bear out the finding of disease in the left lung by physical examination and gives us a little more confidence in the belief we are dealing with a fairly localized infectious disease—a chronic suppurative lung condition limited to the right middle lobe. Although a bronchoscopy has not been done, I think benign tumor can be ruled out, because we usually find a good deal of collapse in the middle lobe in this condition. There is no evidence on physical examination to suggest tapping the chest, and probably even nothing on x-ray, although to rule out the diagnosis of empyema with bronchial fistula you would have to tap the chest and probably want to review the physical findings that are given here. I think we can say that the process is probably not an empyema with a bronchial fistula, dating back to the original empyema. Such empyemas are very often associated with a bit of tubing that has been left in, or a piece of bone from a rib end. We have several areas of cavitation demonstrated in the x-ray, so I should be inclined to feel we had ruled out bronchiectasis, tumor, and yeast and fungus infections, and that the differential lies chiefly between empyema and lung abscess. On the basis of the x-ray, I will make a diagnosis of multiple lung abscesses with general suppuration of the right middle lobe.

CLINICAL DISCUSSION

DR. RICHARD H. SWEET I thought before the operation that we probably were dealing with multiple cystic disease of the middle lobe because, first, it seemed to be so closely confined to the one lobe, and secondly, the x-ray appearance was not that of bronchiectasis, and it would be rather unusual to have a bronchiectasis of thirty or forty years' standing without some involvement of other portions of the lung. The interesting thing was that when we exposed the lobe it was not small and contracted as is the usual bronchiectatic lobe but there was a large mass of tissue, and protruding from the surface were round hemispherical masses varying from 2 to 5 cm. in diameter or larger. These seemed to be somewhat fluctuant, like cystic tumors. The lobe was pink and closely adherent to the anterior chest wall, also to the diaphragm anteriorly and to the cardiophrenic angle. It was also intimately adherent to the upper lobe and to a portion of the lower lobe. The large thin-walled cystic tumor which Dr. Hampton described was adherent to the adjacent surface of the upper lobe, and in dissecting the mass free we broke into it. It had a wall no thicker than a sheet of paper. We aspirated many ounces of fluid, which was not thick and purulent, such as one sees in lung abscess, but just turbid and watery, very much like sputum mixed with saliva. We finally took the lobe out, Dr. Mallory will tell us what it looked like.

PREOPERATIVE DIAGNOSIS

Bronchiectasis, right middle lobe

DR. CASS'S DIAGNOSIS

Multiple lung abscesses, right middle lobe

ANATOMICAL DIAGNOSIS

Bronchiectasis, right middle lobe, ? congenital type.

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY This is the type of case which immediately brings up questions of definition which are not universally agreed upon. What are the differences between abscesses, bronchiectases and cysts? The distinction between the first two I think we should be able to reach agreement upon in theory, though occasional difficulties may arise in practice. The abscess represents a destructive, necrotizing process in the lung parenchyma. It originates in the alveoli, destroys their walls, results in fusion of many alveoli, spreads peripherally until it erodes the wall of a fair-sized bronchus and then partially drains itself, resulting in a cavity. As the process becomes localized it tends to wall itself off with granulation tissue.

Only occasionally does an epithelial lining grow down from the bronchus to line the cavity. In contrast, bronchiectasis represents dilatation of pre-existing bronchi. Not only are they lined with epithelium but in their walls other bronchial structures such as remnants of cartilage, smooth muscle and elastic tissue are usually easily demonstrable. The pulmonary parenchyma—the alveolar tissue—may be collapsed and atelectatic or scarred and contracted as the result of organizing pneumonitis, but it has not been destroyed. With suitable staining methods it can still be recognized.

In contrast to these two clearly defined pathogenic entities, "cysts" and "cystic disease" represent a conglomeration of unrelated conditions. There are parasitic cysts such as hydatids, and neoplastic cysts such as cystic lymphangiomas. There are fluid-filled, epithelial-lined cysts without bronchial connection, which almost certainly represent developmental abnormalities. Finally, there are air-containing cavities with bronchial connection which may or may not show an epithelial lining. In the latter instance they are difficult or impossible to distinguish from emphysematous bullae, in the former from bronchiectatic cavities. There is a fetal form of bronchiectasis,—undoubtedly a developmental abnormality,—which may persist into adult life, that has often been described as cystic disease. I presume that is what Dr. Sweet has in mind in regard to this case, and I can neither rule it in or out. The bronchiectatic cavities in this specimen were unusually large, thin-walled and superficial. On the other hand I have seen similar pictures in what I believe was acquired bronchiectasis. His history of respiratory infections runs back to childhood. You can interpret them as the etiologic factor in the development of acquired bronchiectasis or as episodes of infection of congenital bronchiectatic cavities, as you will. My choice, I must admit, is for the commoner acquired type.

DR. HAMPTON If the cavities in the lung had no bronchial connection would you not admit the diagnosis of cystic disease?

DR. MALLORY Yes, I should not know what else to call it. But in general, in view of the vagueness of the term, it should be used as rarely as possible.

CASE 24132

PRESENTATION OF CASE

A forty-three-year-old, white, American jeweler entered the hospital with the complaint of difficulty in swallowing.

About eleven months before entry he first noticed that solid foods seemed to stick in his throat. During the next five months this condition gradu-

ally became more severe without pain or other symptoms. At the end of that time the dysphagia increased markedly and was associated with regurgitation. The regurgitated food was occasionally blood streaked. His physician made an x-ray examination and told him that there was some delay in the passage of barium down the esophagus but no definite lesion. He gradually changed to a semisolid diet and for the two months before entry took only liquids. He had no nausea or vomiting or other gastrointestinal symptoms. Three weeks before entry he went to an outside hospital where a barium meal was given and esophagoscopy was done. Following the esophagoscopy he was unable to swallow anything, and this condition persisted up to the time of entry to this hospital. He was kept alive by parenteral fluids. During his illness he had lost about 40 lb in weight and had become very weak and anorexic. He had no other symptoms, and his past and family histories were noncontributory.

Physical examination revealed an emaciated, dehydrated, cachectic man who was unable to swallow even his saliva. There was marked pallor of the skin and mucous membranes. There was soft, diffuse fullness of the lower anterior part of the neck without definite fluctuation. The physical examination was otherwise negative. The blood pressure was 130 systolic, 84 diastolic.

The temperature was 102°F, the pulse 90. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 5,200,000 with 90 per cent hemoglobin, and a white-cell count of 18,600 with 88 per cent polymorphonuclears. The blood Hinton test was negative. The nonprotein nitrogen of the blood serum was 18 mg per cent, the chlorides were equivalent to 102 cc of N/10 sodium chloride, and the protein was 5.3 gm per cent.

On the day following entry an operation was performed for drainage of a retropharyngeal abscess. An incision was made over the clavicle and dissection carried down to the esophagus, where about 120 cc of very foul pus was found in the periesophageal area. A stained smear of the pus showed slender gram-positive bacilli, gram-negative bacilli, and gram-positive cocci in clusters and chains. He continued to run a septic temperature and drained moderate amounts of material from his neck wound. On the fifth day he began to expectorate foul pus, which apparently came from his nasopharynx. A stomach tube had been passed, and he was being given adequate amounts of fluid and nourishment. Early in the morning of the eighth day he bled profusely from his mouth. The bleeding was controlled by setting him up in bed,

but a few hours later he bled profusely again, this time from the wound in his neck. The blood was apparently of venous origin, as it was dark in color and oozed out slowly. The bleeding from the neck occurred twice that day and was controlled by packing of the sinus and by the application of pressure bandages over the shoulder. He was given three transfusions of 500 cc each. Late in the afternoon of the same day he coughed up a little blood and five minutes later suddenly became very dyspneic, he rapidly lost consciousness and died within a few minutes. Just before this final episode his pulse and blood pressure were observed to be normal.

DIFFERENTIAL DIAGNOSIS

DR EDWARD B. BENEDICT. We have to consider all the possibilities of esophageal obstruction in this patient, although most of them seem unlikely. We must first determine whether it is an extrinsic lesion or an intrinsic one. Among the extrinsic lesions is neoplasm of the mediastinum, either primary or secondary. If the lesion is mediastinal, causing these esophageal symptoms, we should have other symptoms such as pressure on the recurrent laryngeal nerve, pressure on sympathetics, causing Horner's syndrome, or pressure on the trachea with deviation and possibly dyspnea. Goiter might produce pressure on the esophagus, and there is swelling of the neck, but that was later proved to be inflammatory, and furthermore, I do not believe that goiter alone could give complete esophageal obstruction. Aneurysm is partially ruled out by the negative Hinton test, and also I cannot conceive of its giving complete obstruction of the esophagus.

Then we come to intrinsic esophageal disease, and the first thing we think of is foreign body. There is no history of such. There is no history of caustic burn. Paralysis of the esophagus is rare and would not give complete obstruction. Diverticulum of the esophagus is unlikely from the history, and would not give complete obstruction. Syphilis of the esophagus is very rare, and the Hinton test is negative. Tuberculosis is very rare. Actinomycosis is extremely rare. Ulcer of the esophagus occurs chiefly at the lower end, whereas this lesion apparently was in the upper portion. Ulcer is also rare and usually gives substernal pain, of which we have no history. Cardiospasm is a fairly common disease of the esophagus. It occurs entirely at the lower end and gives a long history of intermittent symptoms, which we do not have in this case. If it were a benign stenosis from a previous esophagitis or trauma, we ought to have some history of heartburn or trauma, such as is not the case. Also, we have a very ill patient

with complete obstruction, which is unlikely in benign stenosis, furthermore, we have blood-streaked regurgitation, which would be somewhat unlikely

So we come to neoplasm of the esophagus. Benign tumors of the esophagus are very rare, although Jackson has reported myomas, fibromas, myomas, adenomas, angiomas and so forth, but I do not believe they give a picture of this sort. Of the malignant tumors we have sarcoma, which is also very rare. Jackson reported only 7 cases of sarcoma out of 935 malignant tumors of the esophagus. On the law of chance we should be right on a diagnosis of carcinoma because, according to MacMillan at the Massachusetts Eye and Ear Infirmary, that accounts for 40 per cent of all diseases of the esophagus. As one goes over the record it seems as if it were a perfect story for carcinoma of the esophagus—an eleven months' story of difficulty in swallowing, food sticking in his throat, absence of pain, blood-streaked regurgitation, finally restricting himself to liquids, a weight loss of 40 lb., and coming in emaciated, dehydrated and cachectic. It is so typical that it seems too good to be true, but I will make a diagnosis of carcinoma of the esophagus.

Then we have to explain the septic process, the temperature of 102°F., and the white-cell count of 18,000. The serum protein I think was a little low and could go with the starvation. The septic process was undoubtedly due to perforation of the esophagus. Whether it was due to esophagoscopy instrumentation three weeks previously is impossible to say, but it looks suspicious. He was unable to swallow anything immediately afterward. It looks as if they had started up some inflammatory reaction, and possibly a slow perforation developed from that or possibly perforation developed spontaneously. We also have to explain why they could pass a stomach tube if he could not swallow his saliva. I think that is explained by the drainage of the periesophageal process and partial clearing up of the lumen of the esophagus. The final episode of bleeding from the neck seems explainable on the basis of cancer with sepsis infiltrating the periesophageal vessels. I should expect the terminal event to have been a massive hemorrhage, explained on the basis of erosion of a large blood vessel.

I have not asked for any report on the x-rays or esophagoscopies because I suppose they are not available.

DR TRACY B MALLORY: No, they were done at another hospital. Perhaps Dr Sowles can give us some more information.

DR HORACE K SOWLES: I saw this patient on the ward but do not remember the case well. Dr Welch drained the abscess. I shall read his note.

A transverse incision was made about 2.5 cm. above the clavicle with its midpoint overlying the anterior border of the sternomastoid. Dissection was carried down between the sternomastoid and the thyroid gland. The omohyoid muscle was cut. The middle thyroid vein lay above the blunt dissection. The carotid was retracted laterally. A dense layer of fascia was then broken through, and about 120 cc. of very foul pus evacuated from the periesophageal area. A finger could then be introduced into the abscess cavity. It extended behind the esophagus a short distance on either side of the neck, and it extended for a short distance beyond each clavicle, but the abscess cavity was well delimited in the upper mediastinum. Two drains were inserted.

CLINICAL DIAGNOSES

Carcinoma of the esophagus
Retropharyngeal abscess
Secondary hemorrhage
Asphyxiation

DR. BENEDICT'S DIAGNOSES

Carcinoma of the esophagus
Perforation of the esophagus
Periesophageal abscess
Secondary hemorrhage.

ANATOMICAL DIAGNOSES

Carcinoma of stomach, scirrhus, colloid
Perforation of the esophagus
Periesophageal abscess
Pulmonary embolism

PATHOLOGICAL DISCUSSION

DR MALLORY: The autopsy findings verified each of Dr Benedict's diagnoses up to a certain point, but he did not localize the lesions in quite the right spots. It is true the man had cancer, but he did not have cancer of the esophagus. He had cancer of the stomach. It was a large limit plastica which had extended up and completely occluded the cardiac orifice. It involved a short portion of the esophagus, but there could be no question from the type of the tumor, with its scirrhus growth and its signet-ring cells, that it was primary in the stomach. The esophagus was perforated, but it was perforated through an area that was in all probability previously normal, far above the carcinoma. A large abscess developed about the perforation, and the final hemorrhage came from an erosion of one of the periesophageal veins. The abscess had not extended to any of the major vessels of the neck. The final episode was a massive pulmonary embolus.

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PUBLIC-HEALTH ADMINISTRATION IN MASSACHUSETTS

PREVIOUS to 1858 very little attention had been given to the causes and prevention of disease except as physicians had, in connection with practice, given such advice or information as seemed appropriate for patients under treatment. But after the ringing indictment of the people by Lemuel Shattuck in that year, in which he urged sanitary reform because of the "thousands of lives lost which might have been saved, and the tens of thousands of cases of sickness that occur every year which might have been prevented," there was an awakening of interest in preventive medicine. Other public-spirited men united with Shattuck in a campaign to bring about reforms in dealing with disease, with the result that the Massachusetts legis-

lature enacted a law in 1869 creating the first state board of health in this country. Then began the organized battle for better health in this State which has been carried on with increasing success through the succeeding years.

In 1879 the title and functions of the board were changed to include charity and lunacy, and the added burden of these other departments of state administration imposed complicating responsibilities which were not wholly in harmony with purely health matters. As a result, in 1886 the care of the indigent and the care of the insane were transferred to their appropriate administration departments, and the original title of Board of Health was resumed and continued until 1914. In that year certain members of the legislature were informed that plans were being formulated to reorganize the board along lines not wholly devoid of political implications.

This movement was regarded as inimical to improved public-health policies, and a defensive counter maneuver, in the form of a bill designed to preserve these policies and traditions and to keep them free from political influence, was proposed. For this purpose, conferences were arranged by Dr. Enos H. Bigelow, then a member of the legislature, with certain physicians, with the result that a voluntary committee was formed to study the situation and formulate a suitable bill. Fortunately the Hon. David I. Walsh was at the time governor of Massachusetts, he cordially co-operated with the committee and supervised the drafting of the bill. One significant episode in connection with the campaign was the appearance before the Council of the Massachusetts Medical Society of the Governor who proclaimed his approval of the bill and assured the medical profession that he would not "play politics with the public health of Massachusetts." This position of the Governor augmented by the work of Dr. Bigelow in the House of Representatives brought about, in 1914, the passage of the bill creating the Department of Public Health, thus inaugurating a new era in the administration of public health in Massachusetts. This department has never been subjected to political interference.

Throughout these sixty-eight years of public-health administration, eminent physicians have guided the health policies of this Commonwealth. During the years of the Board of Health the executive duties were discharged by two chairmen, Dr. Henry I. Bowditch from 1869 to 1886 and Dr. Henry P. Walcott from 1886 to 1914, assisted by executive secretaries in the personnel of Dr. Henry P. Derby, 1869 to 1874, Dr. Charles F. Folsom, 1874 to 1880, Dr. Samuel Abbott, 1880 to 1904, Dr. Charles Harrington, 1904 to 1908, and Dr. Mark W. Richardson, 1908 to 1914.

With the change to the Department of Public Health, the first step was the selection of a commissioner. On invitation the United States Public Health Service sent two of its officers for consideration, and after conference with Governor Walsh, Dr. Allan J. McLaughlin was appointed to this office. He proved to be an able administrator and served until recalled to federal service in 1918.

Dr. Eugene R. Kelly, deputy under Dr. McLaughlin, was then appointed commissioner. His natural qualities and previous experiences enabled him to carry on the duties of the position with success until his death in 1925, when Dr. George H. Bigelow, deputy under his predecessor, was given charge of the department. Endowed with a brilliant mind and unusual physical vigor, Dr. Bigelow completed programs under way, initiated important changes in administrative detail, and accepted new duties imposed by the legislature, which were carried on with credit. He embraced every opportunity for incursion to new fields of work with enthusiasm and always seemed to adapt himself to meet unaccustomed associations and problems. His powers of adjustment enabled him to succeed in administrative experiments, as for example, the conduct of the state cancer program at Pondville. His term of office extended through eight years. He resigned to accept the directorship of the Massachusetts General Hospital, but he never lost interest in public-health work and used his influence to secure his successor in the person of Dr. Henry D. Chadwick.

By a fortunate coincidence Governor Joseph P. Eli, then in office, knew Dr. Chadwick personally

and was familiar with his great contributions to public health in this State and elsewhere. He approved of Dr. Bigelow's recommendation, and Dr. Chadwick was induced to come back to Massachusetts in 1933 as commissioner.

Dr. Chadwick did not seek the position, the office sought the man. The accomplishments of his four years as commissioner have justified the appointment.

Doctor Chadwick received his medical degree from the Harvard Medical School in 1895 and served a surgical internship at the Boston City Hospital. He practiced medicine in Waltham until 1907 when he was appointed superintendent of the Vermont Sanatorium at Pittsford. In 1909 Dr. Chadwick was invited to direct the construction of a new state sanatorium in Westfield, and was subsequently made superintendent. During the next twenty years, he developed one of the first sanatoriums for tuberculous children in the country, and impressed with the high fatality of pulmonary tuberculosis in children, secured legislative support for a ten-year program for the discovery and control of tuberculosis in children—the first organized state effort in this field, and the most comprehensive plan ever completed.

In 1929 Dr. Chadwick accepted a position in the Detroit City Health Department. He had full charge of the tuberculosis program, and for the first time developed adequate diagnostic and sanatorium facilities for Negroes affected with the disease. To meet the needs for additional hospital facilities he arranged for the subsidizing of beds in private hospitals and the training of medical and nursing personnel to make these beds effective. While in Detroit he was also engaged in the survey of the tuberculosis problems in the cities of Washington and Denver, and advised the official organizations of those cities in the development of their diagnostic and sanatorium programs.

Among his outstanding achievements as commissioner in Massachusetts is an extensive study of the state public-health laws by representatives of various official and voluntary public-health organizations, with the financial assistance of the Commonwealth Fund of New York City. This

study resulted in a comprehensive set of recommendations, many of which have been enacted into law. As a result of one of these the Department of Public Health was authorized in 1937 to contract with one or more metropolitan hospitals for the care and study of a group of not more than twenty-five patients with chronic rheumatism in order to determine the possibilities for relief of the victims of that disease. Another recommendation resulted in the taking over and operation of all municipal syphilis and gonorrhea clinics by the department. As a result of a third recommendation the department has been authorized to set up and maintain special facilities for the transportation of premature infants to certain hospitals for adequate care.

Under a legislative appropriation of 1934 the work of the Pondville Hospital was supplemented by the construction of a ward for twenty-five additional beds and a service and medical building which provides all modern operative facilities for treatment of cancer patients. In 1937 a new unit was added to the Westfield State Sanatorium. This provides fifty beds with complete surgical and radiologic facilities for the treatment of cancer in the western part of the State, and one hundred and forty-four beds for adult tuberculosis.

In 1936 the pneumonia serum program, started with the aid of the Commonwealth Fund, was taken over by the department. This program involved the establishment of some eighty typing and serum-distribution stations in general hospitals throughout the State, in addition to the manufacture of pneumonia serum at the Antitoxin and Vaccine Laboratory at Forest Hills.

With the assistance received under the Social Security Act the department's program in child and maternal hygiene has been greatly expanded, and approximately twelve per cent of the supplementary funds have been used for postgraduate medical education of Massachusetts physicians.

Federal activities under the CWA, WPA, PWA and CCC have greatly increased the department's work and responsibilities in the field of sanitary engineering. This has included a very effective

mosquito control and drainage program on Cape Cod, and the study and approval of plans for a large number of municipal sewage-disposal systems receiving federal aid. Under the guidance of the engineering staff much has been done to reduce pollution of many rivers and streams of the State. At Dr Chadwick's suggestion the sanitary engineering work at all state institutions has been taken over by the department with a substantial saving in expense. Requests from cities and towns for advice and assistance in sanitary problems have doubled in the past four years, and in 1937 a sanitary engineering laboratory was opened in Westfield which provides the same type of service in western Massachusetts which has been previously available in the eastern part of the State.

An example of Dr Chadwick's constructive co-operation with the medical profession is his development of the Services for Crippled Children. Legal responsibility for this work was transferred from the Department of Public Welfare to the Department of Public Health in 1936. With the advice and assistance of the state and district medical societies ten clinics have been established in different areas, at which children are examined only on application of a physician, and hospitalization is recommended only with approval of the local medical society. Physiotherapy, public health nursing and social service are provided through the clinics, acute cases are hospitalized in the local general hospitals, and chronic cases are admitted to the Lakeville State Sanatorium.

In addition to maintaining the efficiency of his department Dr Chadwick has won the respect of the medical profession and local health officials throughout the State. The approval of the Massachusetts Medical Society and the Massachusetts Public Health Association is shown by appropriate resolutions adopted by these bodies at meetings held this year. It is the hope of our people, we believe, that Dr Chadwick be continued in office so that the Commonwealth will still have a public-health service of the highest rank. Such service has been available for over sixty-eight years and should not be interrupted.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS
AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 65 PARTIAL SEPARATION
OF THE PLACENTA

Mrs. W., a twenty-nine-year-old primipara, thirty-two weeks pregnant, telephoned at 8.35 a m., December 12, that she was having intermittent and rather severe abdominal pain. A few minutes later her husband telephoned to say that she was bleeding from the vagina and had passed what he estimated to be over a pint of blood.

The family history was unimportant. The patient had had scarlet fever at fifteen but no other illnesses. Catamenia began at seventeen, were regular, every twenty-eight days, and lasted five days without any unusual pain. Her last period was May 4, making the estimated date of confinement February 11.

The patient first consulted her physician on July 8. She was a well-developed and nourished woman. Her heart was not enlarged, there were no murmurs. Her lungs were resonant throughout, and there were no rales. Abdominal examination showed the uterus to be enlarged to a size compatible with the period of amenorrhea. Subsequent visits revealed no complications. The blood pressure averaged about 110 systolic, 70 diastolic, and the urine never showed any evidence of albumin. On July 29 the patient reported a slight brownish discharge after coitus, and on October 10 after an automobile ride, there was a small amount of bleeding.

When seen at home on December 12, the sheet was found to be covered with an area of bright blood about two feet square. An area about two by three feet on the patient's nightgown was also soaked with blood. She had passed clots. There was no other evidence of severe bleeding, but she was "trickling." The uterus was ligneous, and no fetal heart could be heard.

The hospital was immediately notified to set up the operating room for cesarean section, and the patient was transported to the hospital. On arrival she was shaved and catheterized but given no further medication. She and her husband were grouped and cross-grouped with a view to transfusion, but the husband was found to be incom-

patible. A suitable professional donor was located. The patient's temperature was 98.4°F., the pulse 64, regular and of good quality and fair tension. Her blood pressure was 92 systolic, 60 diastolic. An assistant and anesthetist had been summoned and were present on arrival of the patient. A 5 per cent solution of glucose was ready for intravenous medication when needed. An immediate transfusion was not deemed necessary as the patient's general condition was good. No vaginal examination was done. Rectal examination showed a typical primiparous cervix which was not taken up or dilated. In view of the fact that she was a primipara and not in labor, abdominal delivery seemed wisest and safest.

Under nitrous oxide and oxygen and ether anesthesia a low classical cesarean section was done. The membranes were ruptured, followed by a gush of dark blood. A dead male baby, weighing 3 lb., 4 oz., was extracted through the uterine wound. An ampule of posterior-pituitary extract was given intravenously at the time of incision of the uterus, and after delivery of the baby. Examination of the uterus disclosed that the placenta, which was normally seated, was about half separated. The placenta and membranes were delivered complete and intact by suprafundal pressure. This was followed by a considerable amount of blood clot. There was no further bleeding. One ampule of Ergometrine was then given intramuscularly. During the operation 1500 cc of 5 per cent glucose was given intravenously. The patient's pulse at the conclusion of the procedure was 80, and although her blood pressure was 64 systolic, 40 diastolic, there was no evidence of shock.

During her postoperative convalescence she ran a temperature of from 100 to 101°F for several days, otherwise it was normal.

Blood examination on December 13 showed counts of 2,250,000 red blood cells and 15,000 white blood cells, and a hemoglobin of 52 per cent. A stained smear showed a polymorphonuclear leukocytosis. On December 21 the count was 3,200,000 red blood cells, with a hemoglobin of 65 per cent.

Comment Time was wasted in visiting this patient at home, she should have been transported immediately to the hospital.

Abdominal cesarean section on a separated placenta when the baby is known to be dead is not the most conservative method. Had this cervix been dilated sufficiently to allow the rupture of the membranes, and if cervix and vagina had been packed tightly with gauze and a Spanish windlass applied to the fundus, it is probable that the outcome would have been just as successful without the attendant risk of a laparotomy.

This is another case of complete separation of the

placenta with a dead baby that showed no evidence of a toxemia. With a blood pressure of only 64 systolic, transfusion at the close of the operation should have been seriously considered.

TREASURER'S REPORT COVERING REFUND DISTRIBUTION

THE Treasurer of the Massachusetts Medical Society makes the following report regarding the refund to district societies for 1938

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The following table gives the number of payments in, and the refund to, each district as of March 25

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Bristol North	55	58.17
Bristol South	165	174.42
Essex North	152	160.67
Essex South	198	209.28
Franklin	40	42.31
Hampden	254	268.49
Hampshire	47	49.71
Middlesex East	104	109.95
Middlesex North	99	104.66
Middlesex South	759	802.27
Norfolk	633	669.09
Norfolk South	100	105.72
Plymouth	106	112.06
Suffolk	518	547.53
Worcester	335	354.12
Worcester North	83	87.75
	3784	\$4000.00

In 1937, for comparison, the total number of payments for the refund was 3734.

CHARLES S. BUTLER, M.D., *Treasurer*

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ACTIVITIES OF THE MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH IN 1937

It is my privilege to give you a brief summary of the work carried on by the Massachusetts Department of Public Health during the past year. The problem of a healthy population is of individual importance to every resident of Massachusetts.

Many significant events took place in the department during 1937. Doubtless the farthest reaching in its effect on the public health of the State was the report submitted to the legislature in December, 1936, by the Special Commission appointed in 1935 to study and investigate public health laws and policies. All phases of public health activities were studied, and many changes in legislation recommended. Altogether, fifty-eight bills were presented for consideration. It is with much gratification that I can report that fourteen of the fifty-eight recommendations were enacted into law. Others were referred to the next annual session to be taken up again or reintroduced in an amended form.

Three of the laws place upon the department important new responsibilities. Chapter 332 provides for the care of certain premature infants. Under this law boards of health are required, upon request of the physician or parent of the premature infant, to provide transportation to a hospital equipped to care for such infants, and if the parents are unable to pay for such hospital care, it becomes the responsibility of the board of public welfare. The Division of Child Hygiene of the department has co-operated with maternity hospitals throughout the State to see that they have proper equipment and trained nursing personnel to care for premature infants.

Chapter 393 is an act for the hospitalization of patients with chronic rheumatism. The term "chronic rheumatism" comprises a group of diseases the most evident symptoms of which usually appear in the joints. This group of diseases is of grave social and economic import. It is estimated that over 5000 persons in the State are totally disabled and about 140,000 crippled to some degree. The incidence among the poor is about 50 per cent higher than among the well-to-do.

Chapter 391 transfers to the Commonwealth the responsibility for the treatment of persons having genito-

infectious diseases, who are unable to pay for private medical care. The vast amount of work on a state wide basis which this legislation entailed made a new division necessary. The Subdivision of Venereal Diseases, formerly part of the Division of Communicable Diseases, was changed to the Division of Genito-infectious Diseases.

An interesting feature of the work of the department is that being done for crippled children. Federal grants from the United States Public Health Service and Children's Bureau made possible the establishment of ten clinics throughout the State. Seven hundred crippled children have been admitted to these clinics. During the year 1423 clinic visits were made and over 2000 physiotherapy treatments given either in the patients' homes or in a central gathering place. One hundred and eighty-four children were admitted to hospitals for surgery or to be fitted with apparatus to correct deformities. These clinics take care of underprivileged children who would not otherwise receive proper treatment.

Five more communities passed regulations requiring the pasteurization or certification of all milk sold locally. This brings to thirty-seven the number of communities that have protected their citizens from milk-borne diseases.

The Division of Communicable Diseases reports that the past year was characterized by the lowest case rate and the lowest death rate for diphtheria in the history of Massachusetts. On the other hand, paratyphoid fever and whooping cough were more prevalent than in any previous year. A total of 97,185 cases of communicable diseases was reported during the year, compared with 106,110 for 1936. Most of the difference was due to a lower incidence of measles and mumps.

Lobar pneumonia continued to show high incidence. For the second year the pneumonia program was carried on entirely at state expense. An increasing number of physicians are making use of the serums supplied free by the State to combat deaths from pneumonia. The Massachusetts pneumonia program is attracting attention all over the country, and is an important addition to the health work carried on by the department.

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Q What, exactly, is meant by a "premature infant"?

A. The law defines a premature infant as one weighing five pounds or less. They need special care. There are many infants weighing more than five pounds who are feeble and in need of special care. We hope that eventually this program will help improve the standard

of care of all such infants and their mothers, and thus save the lives of 400 or 500 babies each year

Q Is it true that the trickling filter for sewage treatment at the department's Experiment Station in Lawrence was the forerunner of the present trickling filter now in use in many cities and that the Massachusetts Department of Public Health was a pioneer in such matters?

A. Yes, the Experiment Station of the department was the first of its kind established on this continent and probably the first of its kind in the world. In this station were developed most of the basic data on which modern methods of treatment of water and sewage have been founded, and it was also at this station that our present methods for the bacterial examination of water were advanced. As a result of the experiments done at this station, Massachusetts has established procedures for the protection of its water supplies, so that at present about 98 per cent of the population live in communities that have safe water supplies. We are singularly free from water borne diseases, one of which is typhoid fever. A generation ago this disease sickened 2000 or 3000 Massachusetts residents each year. Now it is a rare disease, and this State has the lowest typhoid fever death rate in the country.

DEATHS

COLEMAN—ROBERT M. COLEMAN, M.D., of 42 Church Street, Wellesley, died March 24. He was in his forty fifth year.

Born in Wellesley, he attended the Wellesley schools and Phillips Exeter Academy and received his degree from Tufts College Medical School in 1921. During the World War he was in the naval reserve. Dr. Coleman was a former night superintendent at the Boston City Hospital. He was a former fellow of the Massachusetts Medical Society.

His widow, his mother and a brother survive him.

LUNDWALL—LAURENCE S. B. LUNDWALL, M.D., of 81 Main Street, Gardner, died February 11. He was in his sixty second year.

Dr. Lundwall received his degree from the University of Illinois College of Medicine in 1905. He was a fellow of the Massachusetts Medical Society and a member of the American Medical Association.

MONCRIEFF—WILLIAM A. MONCRIEFF, M.D., of 17 South 6th Street, New Bedford, died December 18, 1937. He was in his forty-eighth year.

Dr. Moncrieff received his degree from Tufts College Medical School in 1913. He was a fellow of the Massachusetts Medical Society, a member of the American Medical Association and a member of the New England Otological and Laryngological Society.

WHITE—BENJAMIN WHITE, Ph.D., died suddenly in Southern Pines, North Carolina, on March 28. He was in his sixtieth year.

Born in Cooperstown, New York, on January 15, 1879, he received Ph.B. and Ph.D. degrees from Yale University in 1900 and 1903. Following postgraduate study in Berlin, Munich, Vienna and London, he was made assistant director of the Department of Bacteriology, Hoagland Laboratory, Brooklyn, New York, in 1903, and was director of this department from 1907 until 1914, except for a two-year period which was spent at Saranac, New York, on account of his health. While at Saranac he was an assistant in the Saranac Lake Laboratory. In 1914 he re-

turned to New York as an assistant director of the Bacteriological Laboratories of the New York City Department of Health and in 1920 was appointed director, Division of Biological Laboratories, Massachusetts Department of Public Health. This position he held until his retirement in 1933, his chief duty being the supervision of the Antitoxin and Vaccine Laboratory at Forest Hills. For the past few years he had lived in New York City, and in addition to serving as a consultant to the Commonwealth Fund, recently completed a book *The Biology of Pneumococcus*, which was published by the Commonwealth Fund as a part of their program covering the serum treatment of pneumonia.

At the time of his retirement he was assistant professor of bacteriology and hygiene, Department of Bacteriology, and assistant professor of preventive medicine and hygiene, Department of Preventive Medicine and Hygiene, Harvard Medical School, and lecturer in immunology and instructor in the biological assaying of drugs at the Massachusetts College of Pharmacy. He was an honorary fellow of the Massachusetts Medical Society, a fellow of the National Academy of Arts and Sciences and a member of the National Tuberculosis Association, the American Association of Pathologists and Bacteriologists, the Society of American Bacteriologists, the American Public Health Association, the Society of Experimental Biology and Medicine and the American Association of Immunologists. During the War, he served as a captain in the Sanitary Corps. He had been a member of the editorial board of the *New England Journal of Medicine* for many years.

He is survived by his widow, Nona (Solari) White, whom he married in 1935.

MISCELLANY

CHICAGO TUMOR INSTITUTE

The Chicago Tumor Institute, a nonprofit organization, located at 21 West Elm Street, Chicago, was opened March 21. It offers consultation service to physicians in the diagnosis and treatment of cancer and radiation facilities for cancer patients. The institute also proposes to conduct research and to offer training to physicians who may wish to qualify as specialists in the study and treatment of this disease.

The members of the Scientific Committee are: Max Cutler, M.D., director, Sir G. Lenthal Cheatle, F.R.C.S., Henri Coutard, M.D., Arthur H. Compton, Ph.D., and Ludvig Hektoen, M.D. The Board of Trustees is composed of the following: Ludvig Hektoen, president, Arthur H. Compton, vice president, Roy C. Osgood, treasurer, Modie J. Spiegel, Mrs. Francis Neilson, Mrs. Arthur Meeker, Alfred Busiel, and Max Cutler.

NOTES

The Council of Child Neurology Research announces that applications for grants will be considered at the meetings to be held in April and October of each year. The purpose of the council is to encourage original research on the definite problems coming within the scope of child neurology and allied fields. Applications must be in the hands of the director, Dr. Bernard Sachs, 116 West 59th Street, New York City, before April 1 and September 15. The applicant must state distinctly the problem under investigation and the methods to be pursued.

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of gelatinous material containing daughter cysts. Dr. Cutler discussed the case and pointed out that this patient had a typical history of this condition and that the attack of cyanosis and unconsciousness were due to the anaphylactic shock which accompanies the rupture of the mother cyst.

A 48-year-old Lithuanian was presented as the second case. Her chief complaint on entry was orthopnea and dyspnea of 4 months duration. Her sister had had rheumatic heart disease and her husband rheumatic fever. The patient gave a history of pneumonia at the age of 14 followed by joint pains for 3 months. At the age of 31, in her fourth pregnancy, she was found to have the signs of mitral stenosis and regurgitation with mild decompensation. At this time she was seen by Dr. Paul D. White and was followed by his clinic for 5 years. She did well until 4 years before entry when she again became decompensated and had ascites and pleural effusion. In August 1937, she again showed evidence of cardiac failure and was admitted to the Peter Bent Brigham Hospital in December for similar symptoms. Physical examination at that time showed an emaciated, dark-skinned woman, dyspneic and with considerable congestion of the neck veins. There were signs of a bilateral pleural effusion. The left border of dullness of the heart was 12 cm. to the left of the midsternal line. The mitral first sound was accentuated, with a systolic and presystolic murmur present in this area. A systolic and a short early diastolic murmur were present at the base, and she was fibrillating at an apical rate of 60. The blood pressure was 120/70. Thrills could be felt over both apex and base. The abdomen was distended and a right upper-quadrant mass pulsated expansilely. Edema of the legs and over the sacrum was present. Laboratory data showed evidence of kidney congestion, and the venous pressure was 140 mm. of water in both arms. An electrocardiogram showed right-axis deviation and auricular fibrillation. X-rays of the chest demonstrated fluid on the right and a markedly enlarged heart with a prominence along the left border typical of rheumatic heart disease, calcified valves were seen.

Doctors Burwell, White and Levine discussed the case and pointed out the probability of tricuspid stenosis in a case with such long standing systemic failure. A patient with involvement of the aortic, mitral and tricuspid valves has a more favorable prognosis than one with aortic or mitral lesions alone. A large liver over a period of years in a case of rheumatic heart disease should make one suspect tricuspid valve involvement.

Dr. Burwell introduced the speaker of the evening, Dr. Paul D. White, who presented the history of the development of our knowledge of the cardiovascular system and its diseases. For the past few years Dr. White has made this a hobby and has collected many of the early editions of the authors who have made substantial additions to such knowledge. He displayed many of these volumes. Dr. White has also devised a chart showing the development of knowledge of the circulation from century to century. He has divided this chart into two parts: on the left he has shown the developments in anatomy and physiology and on the right side in parallel fashion he has put pathology and medicine, thus effectively showing the importance of knowledge of the fundamental medical sciences before advances in clinical medicine are made.

The science of hygiene was an important part of early medicine and the earliest written medical records also speak of the use of squill and opium. The Alexandrian school increased anatomical knowledge considerably. In 300 A.D. Galen's work on the circulation of the blood was

The trustees of Tufts College have established a laboratory for research in sensory psychology and physiology, which will be under the direction of Dr Leonard Carmichael, who was recently elected president of the college. Bertram Wellman, now research associate in psychology at the University of Rochester, an expert in the application of electrical technics to psychological and physiological problems, will become assistant director of the laboratory.

Among honorary degrees conferred by Boston University on March 14, Founders Day, was the doctorate of science on Dr William E Chenery, laryngologist and trustee of Boston University

CORRESPONDENCE

CANCER MONTH

To the Editor In connection with the national observance of April as cancer month, the Massachusetts Cancer Program will publicize routine work that is being done throughout the year. In addition to this, a few extra radio broadcasts will be given, and at the completion of one of the regular cancer clinics at each of the twenty-one state-aided clinics, a special cured-cancer clinic will be given. During the first six years of the cancer program approximately one thousand individuals appeared at the clinics who have now been free from cancer for five years or more. About three hundred of these will be present at the special clinics. The following is a schedule of the clinics

<i>Cancer Clinic</i>	<i>Date and Hour</i>	<i>Consultant</i>
Beth Israel—April 21, 11 00 a. m.—	Staff of Beth Israel.	
Boston Dispensary—April 29, 11 30 a. m.—	Staff of Dispensary *	
Brockton—April 12, 11 00 a. m.—	Dr Thomas Anglem	
Cape Cod Hyannis—April 26, 4 00 p. m.—	Dr W M Shedden	
Fall River—April 28, 11 00 a. m.—	Dr J V Meigs	
Fitchburg—April 5, 10 00 a. m.—	Dr Ernest Daland	
Gardner—April 8, 10 00 a. m.—	Dr L S McKittrick	
Gloucester—April 20, 10 00 a. m.—	Dr E P Hayden	
Greenfield—April 1, 10 00 a. m.—	Dr Richard Wallace	
Lawrence—April 26, 10 00 a. m.—	Dr C C Simmons	
Lowell—April 27, 6 00 p. m.—	Dr H Marun, N Y	
Lynn—April 22, 10 00 a. m.—	Dr E. M. Daland.	
New Bedford—April 13, 4 00 p. m.—	Staff of St. Luke's	
Newburyport—April 5, 10 00 a. m.—	Dr C C Franseen	
North Adams—April 28, 4 00 p. m.—	Dr Charles Lund	
Northampton—April 21, 4 00 p. m.—	Dr C C Simmons	
Pittsfield—April 26, 4 00 p. m.—	Dr E. M. Daland	
Pondville—April 20, 3 00 p. m.—	Dr Daland and staff	
Springfield—April 1, 4 00 p. m.,	Dr A W Oughterson	
New Haven.		
Westfield—April 13, 4 00 p. m.—	Dr Daland and staff	
Worcester—April 27, 10 30 a. m.—	not decided	

With Dr H M Clute and Dr G W Taylor as consultants

Every community in which a Co-operative Cancer Control Committee has been organized will have some of its member organizations invite a local physician to speak during the month. It is estimated that there will be upward of one thousand such meetings, with a combined attendance of nearly twenty thousand individuals.

Special radio broadcasts on cancer will be given. The following is a schedule of these talks

WAAB April 6, 8 15 p. m. 'Public Health Aspects of Cancer' by Henry D Chadwick, M.D.

WEEL April 8, 4 15 p. m. 'Fallacies and Facts About Cancer and Cancer Control' by Lila O Burbark, M.D.

WAAB April 13, 8 15 p. m. 'Cancer The disease by Joseph C Aub, M.D.

WEEL April 15, 7 30 p. m. Cancer by Shields Warren, M.D.

For several years Dr Lombard has been making a study of the familial aspects of cancer, his report is completed and will be published in the *New England Journal of Medicine* during the month.

For the past five years work has been progressing on the preparation of a satisfactory code to transcribe the cancer statistical data to punch cards so that the statistical analysis may be facilitated. This is a pioneer type of work, and we have no knowledge of its having been done elsewhere. The completion of this undertaking marks an epoch in the field of cancer statistics. Requests for the completed code have already come from several cancer hospitals in different parts of the country. April will mark the beginning of the transcription of these records to the permanent punch cards.

Throughout the program, the medical profession has co-operated with the department in furnishing advice, in helping with the cancer clinics, in speaking before the public, and in giving unstintingly of enthusiastic support. I take this opportunity of expressing my sincere appreciation.

HENRY D CHADWICK, M.D.,
Commissioner of Public Health

State House,
Boston, Massachusetts

SUSPENSION OF LICENSE

To the Editor This is to inform you that at the meeting of the Board of Registration in Medicine held March 17, it was voted to suspend for six months the license of Dr Solomon Gobert, 141 Meridian Street, East Boston, because of testimony in court.

STEPHEN RUSHMORE, M.D., *Secretary,*
Board of Registration in Medicine.

State House,
Boston, Massachusetts

CHICAGO MEDICAL SOCIETY SPECIAL

To the Editor We are writing to call attention of the members of the Massachusetts Medical Society to the operation of a Chicago Medical Society Special train from Chicago to San Francisco in connection with the American Medical Association sessions in June. Our train will be routed over the Milwaukee Road from Chicago to Omaha, Union Pacific to Ogden, and Southern Pacific to San Francisco, leaving Chicago from the Union Station at 9 00 p. m., Thursday, June 9, arriving San Francisco at 8 30 a. m., June 12.

The Chicago Medical Society Special will be composed of the most modern type, air-conditioned Pullman sleeping car equipment, with lowers, uppers, compartments, drawing rooms, and single and double bedrooms, and will have all the refinements that one can find on a high grade train. It will be operated on a fast schedule, and there will be no excess fare involved, regular passenger fares applying from your home town.

If your Society does not contemplate the operation of a special train, the members of your organization are cordially invited to travel to San Francisco on this train with us. We feel confident that they will enjoy the privi-

lege of traveling with professional friends on our Special." A little later on, a printed itinerary will be issued in which interesting variations of return routes will be briefly outlined.

We hope we may have the privilege of having a good many of your members with us and all reservations will receive our most careful attention.

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The first case to be presented was that of a 44-year-old Italian chef who had come to this country at the age of 6. Before that time he had lived in his father's tavern in Italy. Ten years before entry he had had an attack of mild epigastric pain. Four and a half years before entry he suddenly became black and fainted. He was studied at that time, and a cholecystectomy done. Since then he had had intermittent bouts of jaundice, epigastric pain and clay-colored stools. In October of last year, 3 months before entry, he had had a similar but more severe attack and was admitted to the Peter Bent Brigham Hospital. The liver was found to be 2 cm. below the right costal margin and a circular shadow was seen in the right lobe of the liver by x-ray. An eosinophilia of 25 per cent was present and the skin test for echinococcus disease was positive. He was sent home and reentered in December for operation. Many adhesions and a mass in the head of the pancreas were found, and on irrigation of the common duct, daughter echinococcus cysts were recovered. A drain was inserted into the common duct and the abdomen closed. Following operation there has been irregular, intermittent drainage

of gelatinous material containing daughter cysts. Dr Cudde discussed the case and pointed out that this patient had a typical history of this condition and that the attack of cyanosis and unconsciousness were due to the anaphylactic shock which accompanies the rupture of the mother cyst.

A 48-year-old Lithuanian was presented as the second case. Her chief complaint on entry was orthopnea and dyspnea of 4 months duration. Her sister had had rheumatic heart disease and her husband rheumatic fever. The patient gave a history of pneumonia at the age of 14 followed by joint pains for 3 months. At the age of 31, in her fourth pregnancy, she was found to have the signs of mitral stenosis and regurgitation with mild decompensation. At this time she was seen by Dr Paul D. White and was followed by his clinic for 5 years. She did well until 4 years before entry when she again became decompensated and had ascites and pleural effusion. In August 1937, she again showed evidence of cardiac failure and was admitted to the Peter Bent Brigham Hospital in December for similar symptoms. Physical examination at that time showed an emaciated, dark skinned woman, dyspneic and with considerable congestion of the neck veins. There were signs of a bilateral pleural effusion. The left border of dullness of the heart was 12 cm. to the left of the midsternal line. The mitral first sound was accentuated, with a systolic and presystolic murmur present in this area. A systolic and a short early diastolic murmur were present at the base, and she was fibrillating at an apical rate of 60. The blood pressure was 120/70. Thrills could be felt over both apex and base. The abdomen was distended and a right upper-quadrant mass pulsated expansilely. Edema of the legs and over the sacrum was present. Laboratory data showed evidence of kidney congestion, and the venous pressure was 140 mm of water in both arms. An electrocardiogram showed right-axis deviation and auricular fibrillation. X-rays of the chest demonstrated fluid on the right and a markedly enlarged heart with a prominence along the left border typical of rheumatic heart disease, calcified valves were seen.

Doctors Burwell, White and Levine discussed the case and pointed out the probability of tricuspid stenosis in a case with such long standing systemic failure. A patient with involvement of the aortic, mitral and tricuspid valves has a more favorable prognosis than one with aortic or mitral lesions alone. A large liver over a period of years in a case of rheumatic heart disease should make one suspect tricuspid valve involvement.

Dr Burwell introduced the speaker of the evening, Dr Paul D. White, who presented the history of the development of our knowledge of the cardiovascular system and its diseases. For the past few years Dr White has made this a hobby and has collected many of the early editions of the authors who have made substantial additions to such knowledge. He displayed many of these volumes. Dr White has also devised a chart showing the development of knowledge of the circulation from century to century. He has divided this chart into two parts: on the left he has shown the developments in anatomy and physiology and on the right side in parallel fashion he has put pathology and medicine, thus effectively showing the importance of knowledge of the fundamental medical sciences before advances in clinical medicine are made.

The science of hygiene was an important part of early medicine and the earliest written medical records also speak of the use of squill and opium. The Alexandrian school increased anatomical knowledge considerably. In 30 A.D., Celsus summarized medical knowledge which had been accumulated up to that time. Dioscorides in

60 A.D. wrote a work on *materia medica* that was the authority on the subject until relatively modern times Galen (born about 131 A.D.) studied the heart and arteries in animals, wrote about the pulse, and was acquainted with all of the arrhythmias. Medical schools were founded in Italy around 1100 A.D. These were the important contributions before 1500.

In the sixteenth century autopsies began to be done, cases of pericarditis and big hearts were described, and the relation of aneurysms to syphilis was recognized. It was then gradually realized that heart disease as such could exist, before that time such a possibility was not admitted, doubtless largely because postmortem examinations had not been made. Vesalius published his epochal anatomy in 1543 and gave a description of the heart and circulation, including briefly the coronaries. In the seventeenth century the first treatise on heart disease was written, the valves of the veins were described, Harvey wrote his monumental work on the circulation of the blood (1628), the thoracic duct was discovered, and Malpighi described the capillaries (1661). Toward the end of the century (1679) Bonetus published his important work *Sepulchretum*, an extensive compilation of autopsies done up to that time.

In the first half of the eighteenth century three authoritative books on heart disease were written (Vieussens, 1715, Lancisi, 1728, Senac, 1749). During this century many important contributions were made. The coronary circulation was described as well as the cardiac nerve supply. The first blood pressure study was made by Hales in 1733. The use of percussion in the physical examination of the chest was first described by Auenbrugger (1761), Withering introduced foxglove for dropsy (1785), and angina pectoris as a clinical entity was recognized by Heberden (1768). Pulmonary vascular congestion in mitral stenosis was described by Vieussens (1715), engorgement of the veins of the neck in dilatation of the right heart chambers by Lancisi (1728), and quinine for obstinate palpitation and venesection for pulmonary edema were advised by Senac (1749). Cases of heart block with syncope were described by Morgagni (1761) and confirmed in the next century by Adams and Stokes. Jenner, about 1775, recognized the connection between angina pectoris and coronary disease, confirmed by Parry in 1799.

In the nineteenth century many more contributions made their first appearance. In 1806 Corvisart published his classical book on heart disease. In 1815 Hodgson wrote on vascular disease. Mediate auscultation and the stethoscope were introduced by Laennec in 1819, and in 1825 Stokes in Great Britain advised the use of the stethoscope. In 1832 Hope described left ventricular failure and cardiac asthma. In 1836 Williams wrote on nervous palpitation, reviving the ancient view of Galen and his contemporaries. In 1842 Chevers described a case of chronic constrictive pericarditis and explained its pathogenesis. In 1858 Peacock wrote the first book on congenital malformations of the heart. In 1872 Gull and Sutton described arteriolar sclerosis, and in 1878 Welch produced pulmonary edema experimentally. The first human electrocardiogram was taken in 1887 by Waller. X-ray examination of the chest was made in 1896, a few months after the introduction of this method of study by Roentgen, in that year Francis Williams of Boston demonstrated an x-ray picture of the heart in Washington at the spring meeting of the Association of American Physicians.

From 1900 on, Dr. White found it very difficult to pick out the most important contributions because of the wealth

of material and the closeness to our own time. Among those he chose are Mackenzie's studies of the pulse, Wenckebach's work on cardiac arrhythmias, Krogh's study of the capillaries, investigations of blood pressure, the modern electrocardiograph (first introduced by Einthoven in 1903), Lewis's study of the mechanism of the heart beat, the description of coronary thrombosis by Herrick in 1912, Cabot's contribution on the etiology of heart disease in 1914, and the establishment of cardiac specialization and of the heart journals in various countries in the last two decades.

NOTICES

ANNOUNCEMENT

JOSIAH E. QUINCY, M.D., announces that, beginning April 1, he will continue the practice of the late Dr. Charles Day at the same address, 270 Commonwealth Avenue, Boston.

FAULKNER HOSPITAL

The usual clinicopathological conference will be held at the Faulkner Hospital for its staff and other interested members of the medical profession on Thursday, April 7, at 5 00 p. m.

There will be a discussion of cases by Dr. Burton E. Hamilton and Dr. Charles P. Sheldon.

J. B. HAZARD, M.D., *Secretary*

AMERICAN NEISSERIAN MEDICAL SOCIETY

The fourth annual session of the American Neisserian Medical Society will be held in Washington, D. C., on May 16 and 17 in the Public Health Auditorium located at 19th Street and Constitution Avenue, N. W.

The session will open with a symposium on sulfanilamide, which will be timely and of great value to every one. Dr. Perrin H. Long, of the Johns Hopkins Hospital, will deliver the principal address. Dr. Long's work puts him in the position of being the country's leading authority on the chemistry, mode of action and clinical use of sulfanilamide. Following the presidential address in the afternoon there will be simultaneous meetings of the three following sections: Male Clinical, Female Clinical, Laboratory and Research. The Male Clinical Section will discuss in considerable detail the question of nomenclature, standard record forms, diagnosis and cure. The Female Clinical Section will discuss diagnosis and cure. The Laboratory and Research Section will discuss bacteriology, serology and research. The reports of these deliberations as accepted on the following day will become the society's official opinion and will serve as authoritative information which when disseminated will undoubtedly result in clarifying some of the present needless confusion. This would seem to be an important step toward improving the management and control of gonorrhea. The chairmen of the sections desire all possible assistance from the members, who are urged to attend and take an active part in the deliberations of the section meeting most in line with their interests.

The second day will open with the business meeting following which the sections will submit their reports. There will be ample opportunity for generous discussion before the reports are accepted. The final afternoon will be devoted to the presentation of some extremely interesting papers.

OSCAR F. COX, M.D., *Secretary*

REMOVAL

GEORGE W. PAPER, M.D., announces the removal of his office to 31 Milk Street, Room 1020, Boston

TUFTS ALUMNI LECTURE

The annual alumni lecture of the Tufts Alumni Association will be held at the Tufts College Medical School, on Wednesday, April 6, at 4:00 p. m.

Dr. George W. Holmes, roentgenologist to the Massachusetts General Hospital and clinical professor of roentgenology at Harvard, will speak on Pulmonary Bleeding. Its cause and diagnosis with special consideration of the roentgenological findings.

Medical students and physicians are cordially invited to attend.

HARRY BLOTNER, M.D., *Secretary*

EASTERN HAMPDEN
MEDICAL ASSOCIATION

Because of conflict with the Thursday evening lecture of the Postgraduate Extension Course, the next monthly meeting of the Eastern Hampden Medical Association will be held on Wednesday, April 6, at 4:45 p. m., at the Oaks Hotel, Springfield.

Dr. R. E. Dickson, of Holyoke, will present the scientific paper entitled "Undulant Fever." Case reports will be given by Dr. Edith E. Baldwin and Dr. H. F. Cleveland.

The medical profession is cordially invited to attend.

J. JOSEPH KLAR, M.D., *Secretary-Treasurer*

BOSTON DISPENSARY

25 Bennet Street, Boston
Lecture Hall, Second Floor, 9-10 a. m.

MEDICAL CONFERENCE PROGRAM, APRIL, 1938

- Friday, April 1—Specific Therapy for Certain Anemias of Childhood. Louis K. Diamond
Saturday, April 2—Pneumonia. Dr. Joseph H. Pratt.
Tuesday, April 5—Diagnosis and Treatment of Certain Bone Tumors. Dr. John D. Adams.
Wednesday, April 6—Hospital Case Presentation. Dr. S. J. Thannhauser
Thursday, April 7—Social-Service Case Presentation. Mrs. H. B. Hooker and Miss E. Grundy
Friday, April 8—The Pathogenesis of Pulmonary Edema. Dr. Sidney Farber
Saturday, April 9—Management of Acute Empyema. Dr. Henry L. Cabott.
Tuesday, April 12—Vitamin A Deficiency in Adults. Dr. Harold J. Jeghers
Wednesday, April 13—Hospital Case Presentation. Dr. S. J. Thannhauser
Thursday, April 14—Transurethral Prostatic Resection. Dr. P. N. Papas and Dr. Harold A. Chamberlin
Friday, April 15—Acid Base Balance in Health and Disease. Dr. John H. Talbott.
Saturday, April 16—Hospital Case Presentation. Dr. S. J. Thannhauser
Wednesday, April 20—Hospital Case Presentation. Dr. S. J. Thannhauser
Thursday, April 21—Follow up of Interesting Diagnostic Problems. Presentation of former Diagnostic Hospital patients. Dr. H. G. Brugsch

Friday, April 22—Surgery of Peripheral Vascular System. Dr. James C. White.

Saturday, April 23—Hospital Case Presentation. Dr. S. J. Thannhauser

Tuesday, April 26—Clinicopathological Conference. Dr. R. C. Wadsworth and Dr. Cadis Phipps.

Wednesday, April 27—Hospital Case Presentation. Dr. S. J. Thannhauser

Thursday, April 28—The Significance of the Heterophile Agglutination Test. Dr. Peter Beer

Friday, April 29—Social Security. Professor E. B. Wilson

Saturday, April 30—Hospital Case Presentation. Dr. S. J. Thannhauser

SYMPOSIUM IN HONOR
OF DR. JELLIFFE

The thirty-fifth anniversary of Dr. Smith Ely Jelliffe's editorship of the *Journal of Nervous and Mental Diseases* will be celebrated at the New York Academy of Medicine on April 22.

A neuropsychiatric symposium will be opened by Dr. Adolph Meyer at two o'clock in the afternoon; Dr. Jelliffe will preside. The scheduled speakers and subjects are as follows: Dr. Earl D. Bond, 'Balance in Psychiatric Research'; Dr. George Draper, 'The Man Factor in Disease'; Dr. Frederick Tilney, 'New Interpretation of the Hippocampus'; Dr. Oskar Diethelm, 'Psychiatry and Neurology in the Last Fifty Years'; Dr. Karl Menninger, 'Somatic Correlations with the Unconscious Repudiation of Femininity in Women.' This will be followed by a dinner in the evening, at which Dr. Foster Kennedy will be toastmaster; the speakers include Drs. Abraham A. Brill, Louis Casemajor, Henry A. Riley and Richard H. Hutchings.

WACHUSETT MEDICAL
IMPROVEMENT SOCIETY

The next meeting of the Wachusett Medical Improvement Society will be held at the Holden District Hospital, on Wednesday evening, April 6. Dinner at 6:30 will be followed by a business meeting at 7:30.

SCIENTIFIC PROGRAM

The Administrative Side of the Hospital. Dr. G. A. MacIver, superintendent of Worcester City Hospital, and Dr. G. H. Stone, superintendent of the Memorial Hospital.

Irrigation vs. Vaccine vs. Sulfanilamide in the Treatment of Gonorrhea. Dr. N. S. Scarcello, junior urologist, Worcester City Hospital.

WALTER D. BIEBERBACH, M.D., *President*
NICHOLAS S. SCARCELLO, M.D., *Secretary*

GREATER BOSTON MEDICAL SOCIETY

There will be a meeting of the Greater Boston Medical Society at the Beth Israel Hospital Auditorium on Tuesday, April 5, at 8:30 p. m.

Dr. Louis Nahum, assistant professor of physiology at the Yale University School of Medicine, will speak on 'Comments on the Coronary Arteries from the Clinical Standpoint with Special Reference to Prognosis.'

K. C. ROSEN, M.D., *President*
D. B. STEARNS, M.D., *Secretary*

NEW ENGLAND DERMATOLOGICAL SOCIETY

The annual meeting of the New England Dermatological Society will be held on Wednesday afternoon, April 13, at the Boston City Hospital in the Skin Outpatient Department at 3 00

BERNARD APPEL, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, APRIL 4

MONDAY APRIL 4

- *4 p m Physicians and medical students are cordially invited to attend a clinic presented by the medical surgical and orthopedic services of the Infants and Children's hospitals in the amphitheater of the Children's Hospital

TUESDAY APRIL 5

- *9 10 a m Boston Dispensary Diagnosis and Treatment of Certain Bone Tumors Dr John D Adams
- *10 a m 12 30 p m Tumor clinic Boston Dispensary
- 11 30 a m John T Bottomley Society Carney Hospital Outpatient Department
- 8 30 p m Greater Boston Medical Society Auditorium of Beth Israel Hospital

WEDNESDAY APRIL 6

- *9 10 a m Boston Dispensary Hospital case presentation Dr S J Thannhauser
- *12 m Clinicopathological conference Children's Hospital amphitheater
- *4 p m Tufts Alumni Lecture Tufts College Medical School

THURSDAY APRIL 7

- *9 10 a m Boston Dispensary Social Service Case Presentation Mrs. H B Hooker and Miss E. Grundy
- 5 p m Faulkner Hospital clinicopathological conference

FRIDAY APRIL 8

- *9 10 a m Boston Dispensary The Pathogenesis of Pulmonary Edema Dr Sidney Farber
- *10 a m 12 30 p m Tumor clinic Boston Dispensary

SATURDAY APRIL 9

- *9 10 a m Boston Dispensary Management of Acute Empyema Dr Henry L Cabitt
- *10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A Christian

SUNDAY APRIL 10

- 4 p m Illustrated public health lecture, Faulkner Hospital Auditorium Common Foot Ailments and Their Significance Dr Lloyd T Brown

*Open to the medical profession

APRIL 18—Springfield District Teaching Clinics Page 499 issue of March 17

APRIL 130—Boston Dispensary Medical Conference Program Page 583

APRIL 48—The American College of Physicians. Page 41 issue of July 1

APRIL 5—Greater Boston Medical Society Page 583

APRIL 5—John T Bottomley Society 11 30 a m Carney Hospital Outpatient Department.

APRIL 6—Tufts Alumni Lecture Page 583

APRIL 6—Wachusett Medical Improvement Society Page 583

APRIL 6—Eastern Hampden Medical Association Page 583

APRIL 7—Faulkner Hospital clinicopathological conference Page 582

APRIL 13—New England Dermatological Society Notice above

APRIL 13—New Bedford Cancer Clinic Page 546 issue of March 24

APRIL 13—Eastern Hampden Medical Association Page 499 issue of March 17

APRIL 14—Pentucket Association of Physicians Hotel Barlett 95 Main Street Haverhill 8 30 p m

APRIL 18—Boston Medical History Club Boston Medical Library 8 Fenway Boston

APRIL 18 19 and 20—Thomas William Salmon Memorial Lectures Page 450 issue of March 10

APRIL 22—Symposium in Honor of Dr Jelliffe Page 583

APRIL 23—Massachusetts Memorial Hospitals annual reunion of house officers alumni association Page 546 issue of March 24

APRIL 26—New England Society of Psychiatry Page 377 issue of February 17

MAY 16 and 17—American Neisserian Medical Society Page 582

MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

JUNE 6 7 8 and 9—American Association of Industrial Physicians Page 499 issue of March 17

JUNE 13 17—American Medical Association San Francisco.

JUNE 13 OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 282 issue of February 10

SEPTEMBER 12 14—American Association for the Study of Gonorr Page 545 issue of March 24

OCTOBER 17 21—Clinical Congress of the American College of Surgeons, New York City

OCTOBER 24 26—Academy of Physical Medicine Scientific Session Washington D C.

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p m New Bedford

ESSEX SOUTH

APRIL 6—Gloucester Hospital Gloucester Clinic at 5 p m. Dinner at 7 p m Speaker and subject to be announced

MAY 5—Censors meet at Salem Hospital 3 30 p m

MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p m Speaker and subject to be announced

FRANKLIN

Meeting will be held at the Franklin County Hospital Greenfield at 11 a m the second Tuesday of May

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July

HAMPSHIRE

MAY 11—Page 546 issue of March 24

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club Stonham at 12 15 p m on May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27

NORFOLK DISTRICT

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon

APRIL 7—At the Quincy City Hospital

MAY 5—Annual meeting

PLYMOUTH

Meetings will be held at 11 a m on April 21 May 19 and July 21

WORCESTER

APRIL 13—Hahnemann Hospital Worcester Dinner will be at 6 15, to be followed by business session and scientific program.

MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced

BOOKS RECEIVED FOR REVIEW

Short Years The life and letters of John Bruce MacCallum M.D., 1876-1906 Archibald Malloch. 343 pp Chicago Normandie House, 1938 \$3.50

Index Medico-Pharmaceutique N T Deleau, Rene Fabre and L. Coniver 756 pp Paris Masson et Cie, 1937 120 Fr fr

Macleod's Physiology in Modern Medicine Edited by Philip Bard et al Eighth edition. 1051 pp St. Louis The C V Mosby Company, 1938 \$8.50

Transactions of the American Association of Genito-Urinary Surgeons Vol 30 417 pp Saint Paul and Minneapolis The Bruce Publishing Company, 1937 \$2.50

Pavlov and His School The theory of conditioned reflexes Y P Frolov 291 pp New York Oxford University Press, 1937 \$4.00

Studies from the Rockefeller Institute for Medical Research Reprints Volume 105 620 pp New York The Rockefeller Institute for Medical Research, 1937 \$2.40

BOOK REVIEWS

Primary Carcinoma of the Lung Edwin J. Simons 263 pp. Chicago: The Year Book Publishers, Inc., 1937 \$5.00

This book is an exhaustive study of the more than 550 articles comprising the literature on primary carcinoma of the lung. In all, about 5000 proved cases are mentioned in the literature, but most of the tables in the present work concern only parts of this total number.

From his study, the author draws the following conclusions. There has been a real and not merely an apparent increase of pulmonary carcinoma. Fourteen possible etiologic agents have been mentioned, all of which produce chronic pulmonary irritation. Macroscopically, pathologic specimens may be hilar or peripheral, histologically, the cases may be grouped under (1) squamous cell, (2) adenocarcinoma, (3) undifferentiated round or spindle cell growths. All three types originate from one parent cell—the undifferentiated basal cell of the bronchial epithelium. The so-called Pancoast tumor is simply pulmonary carcinoma in a peculiar location. In most cases pleural "endothelioma" is metastatic carcinoma. The right and left upper lobes are almost equally involved but the right lung more frequently than the left if all the lobes are taken into account. Metastases occur in the order of decreasing frequency in the following organs: regional lymph nodes, liver, lungs, bones, kidneys, adrenals, pleurae, brain, pericardium, pancreas, cervical nodes, heart, thyroid and spleen. Eighty per cent of pulmonary carcinoma occurs in males. Eighty per cent of all cases occur between the ages of forty and seventy. There are only fourteen cases reported in persons nineteen years of age or younger. The symptoms arranged in order of decreasing frequency are as follows: cough, expectoration, pain, dyspnea, emaciation, fever, hemoptysis, dilated chest veins, cyanosis, edema and night sweats. The author then goes on to discuss signs, special laboratory examinations, roentgenological appearance, and finally, treatment.

Thirty pages of tables do not convince the reviewer of the truth of the first conclusion, but the rest are in line with accepted opinion.

The work is advertised as a book by a general practitioner for general practitioners, but it will find its principal use as a reference work for physicians and surgeons who are specializing in diseases of the lung. Most general practitioners will get what they need in a shorter time by reading one or two of the briefer articles by outstanding authorities in the field.

The work lacks force because the writer has had very little clinical experience with the condition he is discussing, and has no sound basis for evaluating the statements of other writers. But the literature is very well surveyed, and the book will be of real value to all who are interested in the subject.

Physiological Chemistry of the Bile Harry Sobotta. 202 pp. Baltimore: The Williams & Wilkins Company, 1937 \$3.00

This volume should be an extremely useful reference book for those who are interested in the study of biliary tract physiology. The title is somewhat misleading, inasmuch as the physiology of the bile pigments is not considered, but the author justifies their exclusion from this volume because of the extent of the subject. He very justly points out the vastness of the literature on the subject of biliary secretion, with the comment that its extensiveness is more imposing than its depth. It is obvious

that he has attempted to clarify many of the discrepancies to be found in the clinical and experimental studies of bile acids, and he has succeeded extremely well. With a great deal of care he points out that bile fistula studies, because of varying techniques, cannot be readily correlated. In some instances, for example, a bile fistula has been a gall bladder fistula with its striking factor of concentration, while at other times it has truly represented a hepatic or common duct fistula with its more diluted hepatic secretion.

Careful definitions of chologogic action, choleresis and cholangenesis are timely, and are important contributions to a much confused conception of biliary tract physiology. The discussion of the effect of bile acids on these functions, as well as on the processes of digestion and enzyme activity, on micro-organisms and in immune reactions, together with that of the pharmacologic action of bile salts, is complete and interesting. The complex chemistry of the bile acids is well presented but leaves the reader more or less in a state of confusion, probably because clarity in this field is still an impossible achievement.

In addition to the excellent summary on the choleric action of bile acids, it is interesting and pleasing to read a fairly authoritative review on the chologogic and choleric effects of various drugs. Calomel is neatly laid in its grave as an inert substance, so far as being a secretory stimulant is concerned. Data on the physiologic activity of dehydrocholic acid (decholin) are given in full, and are of real interest. It is a matter of regret that the clinical use of this preparation has not fulfilled the estimates of its usefulness, as suggested by experimental data.

The author has done well to bury another ghost, namely the therapeutic effect of oil administered orally in dissolving or evacuating gallstones.

Without doubt the book is essentially a complete exposition of the literature on the various aspects of bile acids, and the voluminous bibliography of forty-four pages is an imposing one. The author indulges in no verbiage, and does much in his comments to clarify a distinctly difficult and confusing subject. Futile speculation on most points he labels as such. For the practitioner the volume is detailed and arrives at too few definite conclusions to offer immediate practical aid. The rare clinical observations are not always on a par with the general excellence of the book. To the investigator the book should prove an invaluable source of information and comment on a most interesting but bewildering subject.

Practical Proctology Louis A. Buie. 512 pp. Philadelphia and London: W. B. Saunders Company, 1937 \$6.50

The author has presented a most complete and convincing exposition of diseases of the anus and rectum, based largely on his own tremendous experience. Throughout the entire book there is very clear evidence of careful analysis of the facts obtained from innumerable observations made over a period of years. There is also a very distinct and comforting attitude of practical common sense that makes the volume an excellent basis for reference.

The author states: "In the past ten years once every two days a paper on disease of the colon, rectum or anus has appeared in some accredited medical journal. Amid much that is confusing in all these articles, his book stands out with extreme clarity in all its details. He stresses throughout the importance of careful examination and absolute insistence that any rectal lesion should be considered malignant until proved otherwise. The anatomical descriptions in the book are very clear and are given in great detail."

Surgical technic is described in detail but is easily read. At times the author is rather caustic in his criticism of various maneuvers but always justifiably so. Traditional methods are scrutinized carefully and are frequently discarded because of their complete lack of rationality. In commenting on surgical methods he quite rightly says "One can only describe technic, it cannot be taught."

Certain statistical facts are of interest and are clearly presented. The traditional conception that anal fistula and tuberculosis are commonly associated is convincingly disproved. The use of dilators is frequently, and quite properly, condemned. The supposed relation of retroversion of the uterus to anal and rectal disturbances is clearly discussed and discarded. The entire discussion of hemorrhoids, including the injection method of treatment, is very fairly and successfully presented. The chapter on anal pruritus is a masterpiece and describes the patient, his complaints and their treatment in a manner that can only be based on an unusual experience.

The chapter on polyps is complete, and quite properly the author insists upon radical treatment of all such lesions because of the subsequent danger of cancer. Factual ulcer of the rectum due to radiation of pelvic organs receives adequate attention, and it is important that this frequently overlooked sequel to what may have been a necessary therapeutic procedure is properly emphasized.

The chapter on ulcerative colitis is of interest, and from the point of view of description, leaves nothing to be desired. Remarks upon treatment and prognosis are worded with extreme caution, however, and consist largely in quotations from others. The author has quite wisely refrained from discussing end results in what is obviously a controversial subject.

Syphilis as a traditional cause for rectal stricture is fairly shown to be almost a negligible factor. Lymphopathia venerea is extremely well described, particularly in its relation to stenosing lesions in the rectum, but one wonders why it is differentiated from lymphogranuloma in guinea.

Adverse criticism can find little place in a discussion of this book. The attitude of the writer is always that of a surgeon but is consistently conservative and always convincing. One regrets that there is very little appreciation of the functional disturbances which are so frequently encountered by medical men. This is reflected, for example, in the dietary suggestions for treatment of constipation, which, according to the author, should consist of high residue or high roughage diets—a form of treatment which has been long known to be contraindicated in many cases.

Aside from such minor criticisms, there can be little question that the book is extremely valuable in every respect. The illustrations are numerous and well prepared. The volume is a distinct addition to the literature on the subject.

Concepts and Problems of Psychotherapy Leland E. Hinsie. 199 pp. New York: Columbia University Press, 1937. \$2.75.

The aim of this volume is to discuss and evaluate the general conceptions of psychotherapy in its relation to clinical psychiatry, particularly as based upon the current concepts of mental functioning. It raises important issues in the field of psychiatry.

The author points out that psychotherapy may be roughly divided into ante-Freudian methods (suggestion, general discussion, hypnosis), and the Freudian method of psychoanalysis with its complicated theoretical ramifications and practical therapeutic application. In psychoanalysis, the concepts of analytical psychology (Jung) and

of individual psychology (Adler) had their origin, while psychobiology is a very general term which, according to Adolf Meyer, is an investigation of the interaction of human beings with various environments, and evaluates the activities and capacities of the individual.

There is a critical examination of the various schools of psychotherapy and a discussion of the difficulties of the evaluation of the results. It is pointed out that psychoanalysis can be used only in a small percentage of the total number of patients who seek or require it, partly due to the limited number of qualified analysts and partly because only certain types of cases seem amenable to an analytic therapy. The best results of therapeutic analysis are obtained in the psychoneuroses, sexual perversions and inversions. The author suggests that psychotherapy must eventually submit its data to biometric analysis, such as has already been done in tuberculosis.

Chapter V, by Dr. Carney A. Landis, on the statistical evaluation of psychotherapeutic methods, appears to the reviewer to be one of the most valuable and practical sections for the physician. Here it is pointed out that any therapeutic method must satisfy several major considerations, that it must be rational and effective and that there must be a logical relation between the therapeutic agent employed and the result or cure. In psychological medicine (psychotherapy) these considerations are difficult to evaluate for several reasons. The exact nature of nervous or mental disease is unknown. There may be a disagreement of opinion as to exact etiology (somatic, psychogenic, or both). The relation between therapy and result is less clear than in organic conditions, and finally, there is no uniformity of opinion as to what constitutes an amelioration or cure. Therefore, statistical figures in the field of psychotherapy have to be evaluated cautiously.

Several tables are given from various hospitals, arranged according to diagnostic groups. It is impossible to go into the details of these tables within the limits of a review, except to state that they show that for every ten patients in mental hospitals four are discharged as recovered or improved. The figures vary, of course, with sex, age level and type of mental disease. These figures are compared with reports from institutes which utilize specific psychotherapeutic methods. In the Berlin Psychoanalytic Institute, cases were termed recovered when the symptoms disappeared. The neuroses showed the best recovery rate. A few of the figures, relating to recovered cases or to those much improved, may be summarized as follows: Maudsley Hospital 67 per cent, Cassel Hospital 70 per cent, New York State Psychiatric Institute 87 per cent, Berlin Psychoanalytic Institute 58 per cent in all cases and 91 per cent in completed cases. These figures seem to show that no one type of intensive therapy is more effective than another.

While the author, as a rule, is cautious in discussing the various concepts in mental structure and function and how these influence different psychotherapeutic methods, yet the reviewer must point out that assembled statistics fail to give a genuine picture of what has been accomplished. In the opinion of the reviewer, there are certain neurotic disorders which can be handled without prolonged and deep therapy, provided their dynamic structure is understood, but it was not until the advent of psychoanalysis that such a dynamic evaluation of symptoms could be reconstructed. It must be emphasized that for the more severe and protracted psychoneuroses or character disorders, the therapy of choice is psychoanalysis, as most cases of this type, according to their clinical histories, have had other psychotherapeutic methods and have not been favorably influenced by this surface ploughing.

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ACUTE POSTOPERATIVE DUODENAL FISTULA

A Report of 12 Cases

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DUODENAL fistula is a most distressing but fortunately a rare postoperative complication. Colp,¹² writing in 1923, reported 61 cases, of which 53 were collected from the literature. The mortality in this series was 51 per cent. Bohrer and Milici⁵ added 44 cases from 1923 to 1931. The mortality in this group was 18 per cent, giving a combined mortality of 37 per cent in 105 cases.

In what we believe to be a complete review of the literature from 1865 to 1937, a total of 130 reported cases of postoperative duodenal fistula were found. Establishing an arbitrary period of three months as the maximum postoperative interval during which a duodenal fistula may be considered of the acute type, and excluding those cases in which insufficient data are available, we reduce this total to 116 cases. To this we now add 12 cases from the records of the Massachusetts General Hospital for the past twenty years. A brief summary of each of our own cases appears at the end of this paper. Each has been carefully studied in the hope of obtaining information which may help in treating similar patients in the future. Critical remarks are added to most of the case summaries. It should be kept clearly in mind that many of these patients were treated some years ago, and statements made from the vantage point of our present more complete knowledge of this condition should not be construed as criticism of the actual treatment.

There are two general types of duodenal fistula: the lateral type, in which the opening is in the duodenal wall but the continuity of the gastrointestinal tract remains intact, and the end type, in which the fistula results from leakage from the closed duodenal stump following gastric resection or pyloric occlusion. In the latter group, the continuity of the gastrointestinal tract has of course

been interrupted and re-established by some form of gastrojejunostomy.

That the end type is much less common and a much more benign condition than the lateral type is shown by the fact that the former occurred in only 14 cases in the entire series of 128, with but 2 deaths, a mortality of 14 per cent, while the mortality of the 114 cases with the lateral type was 40 per cent.

The surgical procedures which preceded the development of the fistula have been divided into groups and listed in order of numerical importance in Table 1. These procedures cannot in them-

Table 1 *Surgical Procedures Preceding Onset of Fistula.*

PROCEDURE	NO. OF CASES
Gastric surgery including resection for cancer or ulcer, gastroenterostomy and pyloric occlusion	23
Right nephrectomy for cancer, hydronephrosis and pyonephrosis, nephrolithiasis and perinephric abscess	22
Duodenorrhaphy for perforated duodenal ulcer with or without gastroenterostomy	17
Cholecystectomy for acute or chronic cholecystitis and cholelithiasis	15
Combined surgery on the extrahepatic biliary system and the upper gastrointestinal tract	15
Cholecystostomy for acute cholecystitis	8
Exploration of the common duct with or without cholecystectomy	8
Incision and drainage of an abscess in the right upper quadrant	7
Suture of a traumatic rupture of the duodenum	5
Miscellaneous operations with accidental perforation of the duodenum	5
Resection of a duodenal diverticulum	1
Incision and drainage of an appendix abscess	1
Appendectomy with drainage	1
	128

selves be considered true etiologic factors. There were involved in each operation, however, certain fundamental factors which led to the production of duodenal fistulas. They may be divided into three groups, any combination of which may be present in a given case.

(1) *Trauma.* An unrecognized perforation of the duodenum may be made at the time of operation, or the duodenal wall may be sufficiently traumatized and devitalized so that a spontaneous

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perforation occurs during the postoperative period. Drainage material placed in contact with the duodenal wall may be a contributing traumatic factor in the production of necrosis.

(2) *Sepsis* Infection at the site of operation may cause necrosis of the duodenum and subsequently the development of a fistulous tract.

(3) *Improper healing* That a sutured wound of the duodenal wall does not heal may be caused by the local condition or by various factors in the patient's general condition. Both sepsis and trauma may be local factors interfering with healing. That purulent infection rapidly destroys the tensile strength of catgut has been shown by Howes,²⁰ and that trauma and devitalization interfere with healing is too well known to require discussion. Other important local factors are faulty suture technic or material, the presence of drainage material adjacent to a suture line, and improper hemostasis with the collection of blood or serum, with or without subsequent infection. In addition, various systemic factors may affect the healing of a sutured wound in the duodenum. Howes, Briggs, Shea and Harvey²⁸ have shown that starvation has a retarding effect on wound healing. Lanman and Ingalls³⁰ have recently demonstrated the importance of vitamin-C deficiency in improper wound healing. Dehydration has long been recognized as influencing regeneration of tissue.

With the increasing knowledge of the underlying chemical changes involved in extensive loss of duodenal contents, and with improvement in methods of combating these changes, the mortality statistics have shown a gratifying decline. Table 2

Table 2 *Mortality Rates in Cases with Acute Postoperative Duodenal Fistula*

YEARS	NO. OF CASES	MORTALITY
		%
1901-1905	13	46
1906-1910	5	80
1911-1915	22	59
1916-1920	17	24
1921-1925	30	37
1926-1930	26	23
1931-1935	10	10
1935-1937	5	60
Total	128	38

shows the mortality by five-year intervals since 1900, and the number of cases in each five-year period. Credit for the clinical progress reflected in these generally lower mortality figures must be given to a large number of workers. The more important findings follow.

Elman and McCaughan¹⁵ demonstrated the fatal effect on dogs of the total loss of pancreatic juice. Loss of electrolytes and dehydration are factors leading to this result, and life can be prolonged

by parenteral administration of Ringer's solution. Death cannot be prevented by this treatment, however, and occurs after some weeks. It is apparently not due to inanition and the possibility of the loss in the pancreatic secretion of some essential substance other than water and electrolytes has been suggested.

Prolonged loss of gastric secretion will eventuate in death owing to depletion of chlorides, dehydration and alkalosis, and changes in kidney function—the so-called “dehydration kidney.” The gastric secretion itself is not essential to life, but chlorides and water are. This has been amply proved by White and Fender³¹ and by Gamble and Ross.²¹

In experimental animals prolonged loss of bile is compatible with life, as shown by Walters and Bollman.⁷⁵ It does lead, however, to an increase in fibrinogen content and viscosity of the blood, a bleeding tendency, faulty fat metabolism and a lowered blood calcium and phosphorus.

If a sufficiently large proportion of the duodenal contents is lost through the fistula, the patient will soon suffer from nitrogen starvation due to deficient protein intake. This is reflected in a lowering of the serum protein. The work of Jones, Eaton and White³¹ has shown experimentally that this is an important factor in making fluid accumulate in the tissues and producing edema. They emphasize that there are various other important elements in the production of postoperative edema, such as serous drainage, sepsis and the administration of excessive amounts of water and sodium chloride.

Thus in a patient with a duodenal fistula the following chemical mechanisms are brought into play as a result of loss of duodenal contents and starvation.

Blood chlorides fall, owing to the loss of chlorides present in the secretions of the stomach, liver and pancreas. The tissue chlorides follow a course parallel to that of the plasma chlorides.

Sodium bicarbonate is lost in the bile and pancreatic secretion. This loss, together with that of chlorides, tends to decrease the salt concentration of the plasma.

The *carbon-dioxide combining power* of the blood is increased. Loss of hydrochloric acid leaves an excess of base in the plasma which is combined with carbon dioxide to form bicarbonate. The increase in carbon-dioxide combining power does not necessarily parallel the loss of chloride, owing to the increase in ketone bodies and organic acids resulting from faulty metabolism and tissue breakdown.

Dehydration occurs, being due to fluid loss and the inability of the body to retain water in the face

of a falling salt concentration. This leads to a decreased fluid content, increased viscosity of the blood and slowing of the circulation. Cyanosis may occur, and polycythemia and a temporary elevation of the plasma protein may be present.

The *nonprotein nitrogen* of the blood rises after some days. Several factors contribute to this. Kidney excretion may be impaired by faulty circulation, and increased formation of waste products, due to tissue breakdown, may occur.

The *serum protein* falls gradually, on account of insufficient protein intake. The importance of this factor in the production of nutritional edema has been discussed above.

The rapidity with which these changes occur is the result of a balance between the proportion of duodenal contents lost through the fistula on the one hand, and the success of the efforts made to offset this loss on the other.

That extremely large amounts of drainage may occur from a duodenal fistula is well known. Erdman¹⁶ reports the collection of 4000 cc. in a single day. Various factors contribute in determining the amount of drainage. The amount taken by mouth is the most obvious one and needs no discussion. The size and location of the fistulous opening are obvious factors.

In addition to these purely mechanical influences, the muscular activity of the duodenum plays a most important part, as pointed out by Perl.¹⁸ He also emphasizes the increase in peristaltic activity due to duodenal irritation. Normally the duodenal contents are passed to and fro a few times, to promote rapid mixing of food and digestive juices, before passing into the jejunum. The normal intraduodenal pressure is 15 cm. of water, and rises higher during peristaltic activity. This undoubtedly explains why such a large amount of drainage may come from a relatively tiny fistulous opening in the duodenum.

The diagnosis of postoperative duodenal fistula usually presents no great difficulty. Typically the onset is sudden, coming usually within the first two weeks after operation, often immediately following the removal of a drain. It is characterized by a copious alkaline watery discharge from the wound, with rapid and widespread irritation and necrosis of the tissues of the abdominal wall. The diagnosis can usually be easily confirmed by the administration of a dye, such as carmine or methylene blue, by mouth. In the lateral type of fistula the dye appears on the dressing almost at once, while in the end type the interval may be somewhat longer, but the dye generally appears in sufficient quantity to clinch the diagnosis.

The treatment of duodenal fistula falls naturally into two phases: first, adequate local care of

the wound to minimize irritation and digestion of tissue, secondly, systemic treatment to offset so far as possible the effects of the loss of duodenal contents.

It appears from our study that the most important single factor in the local care of the wound is the use of constant suction, to keep it as dry as possible and prevent prolonged contact between the duodenal contents and the tissues of the abdominal wall. Cheever¹⁰ gives credit to Jones and Williams for first advocating this procedure, and most recent writers advocate its use.

In addition to the mechanical removal of irritating substances from the wound, a variety of local applications have been advocated. These may be divided according to their intended action as follows:

- (1) Chemical neutralization of the proteolytic ferments by combining them with an excess of peptone powder, protein and fat, beef juice or Bovinine (Potter,⁶⁰ Warshaw,⁸ Kittelson³⁴). McEvers⁴⁷ has suggested that the same effect may be obtained by the oral administration of boiled milk, acidophilus milk or reliquefied milk concentrate.

- (2) Mechanical adsorption of the ferments by finely divided charcoal, kaolin or bronzing powder.

- (3) Inactivation of the tryptic ferments by producing an acid medium. Irrigation of the wound with N/10 hydrochloric acid (Potter⁶⁰), citric acid (Johanson³⁰) or 5 per cent tannic acid (Perl¹⁸) has been suggested.

- (4) Protection of the surrounding skin by boric ointment, zinc oxide or liquid latex. In our hands it has proved difficult to apply these in such a way that the duodenal contents will not seep under them, thus making the situation worse.

- (5) Elimination of positive intraduodenal pressure by passing a tube into the duodenum, as advocated by Perl¹⁸.

After reading the uniformly successful reports on various combinations of these methods, one must conclude that the extreme care with which the technic is applied is more important than the actual substances used, and that any logical plan of local treatment will, if carried out with sufficient patience and care, yield a satisfactory result.

The importance of early recognition of the fundamental chemical changes resulting from loss of duodenal contents cannot be too strongly stressed. The rapidity with which these changes may develop is illustrated in the abstract of Case 3. This woman was moribund ten days after the establishment of the duodenal fistula. The speed with which such a desperate situation may develop depends on the patient's general condition at the time of operation, and upon the proportion of the

duodenal contents lost through the fistula. Various chemical determinations should be used at frequent intervals to help keep the surgeon informed as to the patient's condition, and to determine the vigor with which the various chemical changes must be combated.

The best clinical guide to an adequate fluid balance is the urinary output. To keep this up to 1500 cc in twenty-four hours in a patient who is losing a considerable amount of fluid through a duodenal fistula requires the administration of large amounts of parenteral fluid. The danger of giving excessive amounts of fluid and sodium chloride, with the resultant production of edema, has already been mentioned, and must be kept constantly in mind.

Glucose must be given in the parenteral fluid to supply tissue demands and replenish glycogen stores in muscle and liver. The carbon-dioxide combining power of the blood must be checked at frequent intervals. The blood nonprotein nitrogen gives an index of the degree of success of the kidneys in eliminating waste products.

The serum-protein level must be frequently determined. Providing an adequate parenteral supply of fluid and salt is a relatively simple problem compared with that supplying a parenteral protein. Blood transfusion is one means of giving the body protein, but in practice it has proved rather ineffective in the face of prolonged nitrogen starvation. Nevertheless, the value of a well-timed blood transfusion as a general stimulant and as a means of combating secondary anemia cannot be overemphasized.

It must be remembered that the treatment of a patient with a duodenal fistula is a long-drawn-out process. The average duration of drainage in our cases was twenty-two days, and the longest single period was six weeks. In dealing with a small fistula with relatively little loss of duodenal contents, local care of the wound, parenteral fluid, salt and glucose, together with transfusion as indicated, may be adequate therapeutic measures.

If the fistula is large and the drainage profuse, the patient's course may be steadily downward in spite of all these efforts. It is in these cases that death occurs, and often the outcome is fatal because the situation becomes desperate before it is recognized as such, and too late for adequate defense measures. Once serious disturbances in body chemistry have developed, effective relief is difficult, and these changes must be foreseen and opposed effectively before they reach grave proportions. It is our belief that in treating serious cases success depends upon early recognition of the inadequacy of the parenteral route by itself, and upon the establishment of an adequate means of introducing substances into the gastrointestinal

tract below the fistula. The advantages are obvious: the drainage from the fistula can be collected and replaced in the intestinal tract, and an adequate caloric intake, including a sufficient supply of protein and vitamins, can be provided.

The exact method of effecting this result must be chosen to fit the particular case. It may be possible to pass a small nasal tube through the stomach and into the duodenum far enough to be effective, or a tube may be successfully introduced through the fistulous tract into the duodenum. The latter procedure seems somewhat hazardous, as it may well delay closure of the fistula. If a functioning gastrojejunostomy is present, the problem may be simplified and tube feeding of the collected drainage may be tried.

If these simpler methods are not effective, a jejunostomy must be done. This should be carried out through a short muscle-splitting incision in the left upper quadrant under local block anesthesia. The tube should enter the bowel at least 15 cm below the ligament of Treitz. The exact method for its insertion by a modified Witzel technic has been well described by Linton.⁴³

The dangers of delay in performing a jejunostomy are illustrated in the abstracts of Cases 1, 3, 4 and 5. It is of course impossible to say that if the operation had been carried out at an earlier date the patients would have survived, but it seems obvious that their chances would have been improved, and we believe that in many cases of duodenal fistula a well-timed jejunostomy will prove to be a lifesaving procedure.

SUMMARY AND CONCLUSIONS

1 Twelve cases of acute postoperative duodenal fistula treated at the Massachusetts General Hospital, together with 116 cases from the literature, are reviewed.

2 There are two general types of duodenal fistula: the lateral and the end types. The latter is less common and more benign.

3 Various local and systemic factors of importance in the production of a duodenal fistula are discussed.

4 Treatment is divided into two phases: local and systemic. Constant suction is the most important single factor in local treatment.

5 The changes in body chemistry resulting from the loss of duodenal contents are briefly discussed.

6 The importance of the prevention of these changes by actively combating them in the early stages is stressed.

7 The early recognition of the need of a jejunostomy is emphasized. We believe this to be a lifesaving procedure in many cases.

CASE REPORTS

Case 1 A man of 35 had had a cholecystectomy and choledochostomy performed in 1918. A catheter was sewed into the common duct. Cholecystostomy had been done 3 years previously at an outside hospital. Thirteen days after the operation, following removal of the catheter and the cigarette wick, profuse bile stained drainage from the wound began. That this was a duodenal fistula was immediately recognized.

The patient's course was steadily downhill in spite of parenteral fluid containing glucose and salt, and attempts at rectal feeding. One month after the appearance of the duodenal fistula, jejunostomy was done under ether anesthesia. Twelve days later the patient died.

Comment The loss of duodenal contents, including in all probability a large part of any food taken by mouth, was allowed to continue for a month, without attempting to collect this material and replace it in the gastrointestinal tract. This case occurred a number of years ago, and no blood-chemistry determinations are available. In view of the length of time that the patient lived after the development of the fistula, it seems more than likely that if a jejunostomy had been done as soon as the fistula appeared, and if the duodenal drainage had been collected and replaced in the jejunum, together with an adequate supply of nourishment, he might well have survived.

Case 2 A man of 40 underwent a cholecystectomy and drainage of subhepatic abscess in 1922. No stones were found. The gall bladder was acutely inflamed. He had a long and stormy convalescence with a persistent biliary sinus and was discharged 3 months after operation, with instructions to return in 1 week for cholecystectomy. On readmission the sinus tract was explored in an attempt to remove the gall bladder. The operation was abandoned on account of uncontrollable oozing. A portion of the sinus tract was removed, and on pathological examination showed tuberculosis. Nine days later a duodenal fistula developed.

Fourteen days after operation an attempt was made to do a jejunostomy through an incision in the left upper quadrant. Dense adhesions were encountered, and the operation was stopped because of profuse bleeding, with out an available loop of bowel having been found. Attempts to get a nasal tube into the duodenum were unsuccessful. Constant suction was used to prevent digestion of the abdominal wall, but repeated hemorrhages from the fistulous tract occurred. Many hypodermoclyses and several transfusions were given, but the patient's condition became steadily worse and he died 3 weeks after the appearance of the fistula.

Autopsy showed extensive tuberculous peritonitis, duodenal fistula and a subhepatic abscess cavity.

Comment It seems according to present concepts that every attempt was made to treat this patient properly. These efforts were unsuccessful because of the nature of the underlying process, which was not definitely identified until autopsy.

Case 3 A woman of 28 had a nephrectomy for tuberculosis of the kidney in 1922. The procedure was technically difficult as the surgeon's note states that the kidney was

freed by cutting masses of scar tissue. Immediate and profuse bile stained drainage from the wound was noted. In spite of a high fluid intake by mouth the urinary output was low. Carmine given by mouth appeared on the dressing in 10 minutes. A diagnosis of duodenal fistula was made. The patient's condition became rapidly and progressively worse. Ten days after the operation jejunostomy was considered, but the patient was deemed too sick to stand the procedure, and she died the next day.

Comment This case illustrates how rapidly a patient's condition can become critical when the defect in the duodenum is large and the drainage profuse. It also illustrates the danger of even a few days' delay in performing a jejunostomy in a case of this type.

Case 4 Six months before entry a man of 55 had had a cholecystectomy for acute cholecystitis, which was followed by a persistent biliary fistula and intermittent jaundice. At operation, performed in 1924, a dilated common duct with an obstruction at its lower end was found. No opening into the duodenum could be discovered and a choledochoduodenostomy was done. The gall bladder was drained.

The wound drained profusely with much skin irritation, and a diagnosis of duodenal fistula was made. The drainage amounted to about 4000 cc. daily, and constant suction was used to keep the wound dry. Parenteral fluid containing salt and glucose was given and transfusion was done. The patient's condition became rapidly worse and he died 19 days after operation.

Autopsy showed obstruction of the common duct due to adenocarcinoma.

Comment In retrospect and in the light of our present knowledge, a jejunostomy should have been done as soon as the profuse drainage was recognized as duodenal contents.

Case 5 Cholecystectomy and choledochostomy were done in 1928 on a man of 49. The operation was technically difficult, and an opening was made in the duodenum in freeing it from the gall bladder. There was some question as to whether a spontaneous fistula between the duodenum and gall bladder had been present. Stones were removed from the common duct and a catheter was inserted for drainage. The duodenum was closed in two layers and the suture line was carefully covered with omentum.

Ten days after operation an abscess developed in the wound, followed by profuse drainage. A diagnosis of duodenal fistula was made, and 10 days later the wound was put on suction. Three weeks after the development of the fistula a jejunostomy was done. Two days after this, fecal drainage from the original wound began, and 3 days later the patient died.

No blood chemistry was done until the day the jejunostomy was performed. At that time the blood nonprotein nitrogen was 90 mg per cent, and the blood chlorides were 462 mg (as sodium chloride) per cent. Three days later the nonprotein nitrogen was 188 mg., and the blood chlorides 578 mg per cent. This patient was given dyes for 10 days after the first operation, and no more parenteral fluid until the day of the second operation.

Comment Here again it seems fair to say that if the seriousness of the situation had been recog-

nized sooner and a jejunostomy had been done at once, rather than allowing the loss of duodenal contents to continue for three weeks, the patient's chances of survival would have been improved. At the present time a loss of duodenal contents would certainly not be allowed to continue so long without administration of parenteral saline and glucose

Case 6 A woman of 33 developed a duodenal fistula following a third operation on the biliary system. The first operation was a cholecystectomy done at another hospital. The second was an exploration for biliary obstruction. A dilated stump of hepatic duct was found, but it was impossible to anastomose this to the duodenum, so a tube was inserted and a biliary fistula established. At the third operation in 1929 this fistulous tract was implanted into the duodenum. Profuse bile-stained drainage began at once, and carmine given by mouth appeared on the dressing immediately.

A diagnosis of duodenal fistula was made, and a week later jejunostomy was done and the original wound was put on suction. The collected drainage was introduced into the jejunostomy tube, together with a concentrated liquid food mixture. Five weeks after operation drainage from the incision stopped, and 3 days later the jejunostomy tube was removed.

The blood chlorides were repeatedly measured, and were kept within normal limits by parenteral fluids as indicated. Ten days later the fistula opened spontaneously and drained for 3 days before closing.

The patient was discharged from the hospital 6½ weeks after operation. Her progress after leaving the hospital was complicated by intermittent bouts of biliary obstruction, and she finally died 3½ years after operation.

Case 7 A man of 27 had an exclusion of the pylorus and a posteriorgastroenterostomy performed for duodenal ulcer in 1929. After 7 days of uneventful convalescence he began to run an unexplained temperature, and soon developed some fluid in the left pleural cavity. Three weeks after operation the wound broke open and began to drain profusely. Carmine by mouth appeared on the dressing within 1 hour. A diagnosis of duodenal fistula was made.

Constant suction was instituted and the wound progressed well. No blood-chemistry determinations are recorded. Drainage ceased, and 7 weeks after operation and 4 weeks after establishment of the fistula the patient was discharged with the wound nearly healed.

Comment This is the only case in our series of the end type of duodenal fistula, and illustrates the relatively benign course of most of these cases.

Case 8 A man of 77 had a resection of the pyloric end of the stomach and a posterior gastroenterostomy performed in 1934. On the 11th postoperative day the wound separated, requiring resuture. Profuse drainage from the wound continued and a diagnosis of duodenal fistula was made.

The case was treated by intravenous glucose in normal saline and by transfusion. Two weeks later the blood chlorides were equivalent to 107 cc. of N/10 hydrochloric acid, and the serum protein was 5.2 gm per cent. A tube was successfully passed through the fistula into the duodenum and feedings were started. Immediate improvement was noted. The serum protein remained at 5.1 gm per cent. The duodenal tube was removed 4

weeks after the establishment of the fistula. There was no further drainage. The patient was discharged 73 days after operation.

Comment This case illustrates the success with which the situation can be kept under control if a tube can be passed through the fistula into the duodenum.

Case 9 A woman of 52 was operated upon for carcinoma of the stomach in 1936. A posterior gastroenterostomy for duodenal ulcer had been done 25 years previously. Abdominal exploration revealed a carcinoma of the stomach, which was amenable to surgical removal. The posterior gastroenterostomy appeared normal. The duodenum was shrunken to a small, thickened, finger-like process. The gastrosolic and gastrohepatic omentums were divided, but at this point the patient's condition became so poor that it was deemed wise to abandon further operation. The wound was closed and the patient was returned to the ward. On the 15th day after operation wound sepsis developed, and the next day profuse bile stained drainage from the wound began. A diagnosis of duodenal fistula was made.

For the next 2 weeks the blood chlorides and the carbon-dioxide combining power were kept within normal limits by means of parenteral fluids. The blood non-protein nitrogen was not elevated, and the urine was negative. The serum protein fell to 4.1 gm per cent. The patient went steadily downhill, and died at the end of this 2 weeks period in spite of repeated transfusions.

Comment It is hard to see how the treatment of this patient, once the duodenal fistula was established, could have been improved, at least as indicated by the various chemical factors measured. With a functioning posterior gastroenterostomy a jejunostomy would probably have been of no advantage. Collection of the duodenal contents discharged from the fistula and refeeding by means of a nasal tube in the stomach, however, might have improved the patient's chances of survival, and should have been tried.

Case 10 A woman of 72 was admitted in 1936 with a diagnosis of acute cholecystitis. She was jaundiced, with a van den Bergh of 8.92 mg per cent and an icteric index of 20. The blood nonprotein nitrogen was 26 mg per cent. The acute attack subsided, and 10 days after admission operation was undertaken. It proved to be a difficult procedure. A much dilated common duct was found and opened. No stones were found in it. The ampulla of Vater was easily dilated and the duct was closed around a T tube. There was a stormy convalescence, with pulmonary collapse at the right base and a low urinary output, in spite of the administration of intravenous glucose in normal saline. The blood nonprotein nitrogen rose to 90 mg per cent and the blood chlorides fell to the equivalent of 69 cc. of N/10 hydrochloric acid.

The wick was removed on the 8th postoperative day and some bleeding from the sinus tract occurred. Two days later some digestion of the skin around the sinus was noted. Twenty-two days after the operation, profuse bile-stained drainage began from the sinus with digestion of the wound. Two days later the patient died.

Comment In this case it appears that the duodenal fistula was only the terminal event. Even

previous to its development the patient's condition was so impaired that her chances of survival were poor, and it is hard to believe that any known treatment of the fistula itself could have altered the outcome.

Case 11 A man of 57 was admitted in 1937 because of jaundice. Five years previously a cholecystostomy had been performed. Two months before admission a cholecystectomy was done because of persistent symptoms. Exploration of the common duct was thought desirable at that time but was not attempted because of the technical difficulties encountered.

At operation the region of the common duct was carefully explored. No patent common duct could be found, even by the transduodenal route, and no dilated bile ducts were located. The subhepatic space was drained. On the 7th day after operation there was a sharp increase in the amount of drainage. That this was caused by a duodenal fistula was quickly recognized, and wound suction was started.

Drainage from the fistula exceeded the oral intake by about 700 cc. in 24 hours. Adequate parenteral fluid was given and the blood-chloride level was kept within normal limits. Four days after the onset the serum protein had fallen to 4.6 gm. per cent. A transfusion of 550 cc. of blood was given. Ten days after establishment of the fistula a definite decrease in the amount of drainage was noted, and the next day the oral intake exceeded the amount of drainage. This positive balance continued to increase rapidly, and the patient's general condition improved steadily. All drainage ceased 19 days after the onset of the fistula and the patient was discharged the next day.

Comment This case illustrates how adequate parenteral fluids and local care will control the situation, at least for a relatively short period of time, in the face of a moderately severe duodenal fistula.

Case 12 A woman of 56 had had a cholecystostomy performed 2 months before operation in 1937. At that time choledochostomy and transduodenal removal of a common duct stone were performed. Nine days after operation, following removal of the wick and tube from the common duct, profuse drainage from the wound began and a diagnosis of duodenal fistula was made.

The drainage amounted to about 500 cc. in 24 hours and was collected by constant suction. The blood chemistry was easily maintained at normal levels by parenteral fluids. Nine days after establishment of the fistula all drainage had ceased, and 5 days later the patient was discharged from the hospital.

Comment This case is an excellent example of a fistula with only a relatively small amount of drainage, in which the situation was easily controlled by local measures and parenteral fluid

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THROMBOPHLEBITIS IN THE LEGS

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AS you are well aware, for both the surgeon and the physician thrombophlebitis presents a serious clinical problem. I need not dwell on this. I should like rather to remind you of the basic nature of thrombosis, without knowledge of which a discussion of its clinical behavior is meaningless.

First, and most important, thrombosis takes place only in a blood current—a slow one as a rule. It is not coagulation, or clotting, in which the formation of fibrin is the principal reaction, but rather a deposition of blood platelets, that is, thrombocytes, on the wall of a vein. These thrombocytes, having become plastered together and fixed, build out into the stream a spongelike structure to which the white corpuscles adhere and in whose narrow interstices clotting *then* occurs. The process soon occludes the vein. The oldest portion, or head, of Zahn's classic thrombus is white and tough, since it consists mostly of platelets, and the neck, or mixed portion, which contains an increasing amount of fibrin and red cells, is dark red and still solid, but the tail, which is without plate-

let lamellae and which may extend for a long distance away from the neck, is necessarily clotlike and unsubstantial. Should it grow into a current, it may become so soft and flimsy that finally it can hardly be distinguished from normal blood. Insofar as this friable portion builds itself away from the heart it merely blocks more and more of the peripheral venous tree, but if it grows toward the heart, unfixed in the vein and waving in the current of an entering branch, fragile and ready to break from the body, it is a potential embolus—a serious threat to life. The tendency of most thromboses in their heartward progress is to stop abruptly and heal when they meet a vigorous current, but to grow out into a feeble one as the *propagating thrombus* just described, ready to become a source of minor infarction or of fatal pulmonary embolism.

CAUSES OF THROMBOSIS

There is in the literature much tiresome discussion of the influences which lead to thrombosis in veins. I am reminded of the first medical paper to which I ever listened, in which the author, a medical student, showed that practically every abnormality or disease of the human body was a source of constipation. Nevertheless, among the countless reported causes of thrombosis there are

From the Surgical Clinic of the Peter Bent Brigham Hospital, Boston.
Read before the Boston Surgical Society, December 6, 1937, in connection with a demonstration by Dr. C. H. Best of Toronto of the use of heparin in preventing experimental thrombosis in animals, in preventing thrombosis in glass tubes, and in controlling postoperative thrombophlebitis in human beings. An account of this work by Dr. Best and his associates has already been published (Best C. H., Cowan C. and MacLean D. L. Heparin and formation of white thrombi. *Science* 85:338-339 1937).

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a number of fairly recognizable influences that may be held responsible

Disorders of the Vein Wall In the case of severe local injury, sepsis or actual varicosity, such a basic disorder is clear enough. Thrombophlebitis of the sigmoid sinus in middle-ear disease and the phlebitis of varicose veins are familiar examples. But most thromboses occur in the absence of any such known influences. Aside from rheumatic changes in the vein wall, changes which I have known to be a cause of a very deceptive thrombosis and a fatal embolism, evidence of the significance of degenerative changes even in acute fevers is rather speculative. However, in phlegmasia alba dolens, perhaps the commonest of all thrombophlebitides, I have found, on several occasions, when exploring the pelvis, a remarkably acute nonsuppurative inflammation surrounding the external iliac artery and vein and extending down the great femoral vessels into the thigh. This change has given me the impression of being the cause not only of the venous thrombosis but of arterial spasm as well. I cannot account for this phenomenon, which Cruveilhier noticed many years ago, though it is tempting to lay it to a lymphangitis reaching the iliac lymphatics from the legs or pelvis, and since there is little evidence to show how often it is present, it had perhaps best be kept in mind for future investigation and not taken too seriously at the moment.

Possibly in considering the disorders of the vein wall the factor of age ought to be included. For though thrombophlebitis does occur in young adult life, especially as a complication of childbirth and abdominal operations, middle to advanced age—the years from forty-five to sixty-five—is most liable to it.

Disorders of the Blood Perhaps the most concrete disorder of the sort described is dehydration, such as may result from vomiting, diarrhea, hemorrhage, deprivation of fluids or sweating at the operating table. There is also the rather vague but obviously important influence of injury, in the form of crushes, fractures and, of course, surgical operations. The influence of trauma may be local, as when thrombosis occurs in the great veins of the calf or thigh on the side of a fracture, or general, as when a femoroiliac thrombosis follows an abdominal or thoracic operation or an injury. Again, its influence may be immediate, or perhaps remote and related to the atrophy of disuse.

Conceivably, thrombophilic changes in the blood are related to clotting rather than to thrombosis. Bancroft and his co-workers have established a 'clotting index,' particularly in some preoperative and postoperative states. They believe that by the

use of certain dietary and medicinal steps they not only can lower a high index but can actually diminish the incidence of thrombosis. However that may be, abnormal states of the blood are more easily corrected than are other supposed thrombophilic influences, and, whether chronic or acute, should be kept in mind.

Disorders of the Venous Return These are of the greatest interest. They may be due to general circulatory failure, to cardiac weakness plus venous stasis or to venous stasis alone. Since thrombosis is most apt to occur in a *slowed* current, they are obviously fundamental. A patient sitting up or reclining in bed subjects the return flow from the relaxed legs to a decided slowing. Increased abdominal tension, as in any state of gaseous distention, during pregnancy or parturition, or following abdominal operations, obviously aggravates this unfavorable influence. But the anatomic relations of the upper femoral and iliac veins are perhaps even more important. There are many entering vessels, as is shown in the sketch. These branches, together with the few large valves of the region, are believed to cause eddies which encourage the deposition of platelets. The hypogastric arteries cross the external iliac veins, and the right common iliac artery crosses the left common iliac vein. These relations impede the natural current, on the left more than on the right. There is also present, in the upper calf and popliteal space, an area somewhat like that of the groin where many currents meet, and where many obscure thromboses undoubtedly originate. Aschoff has discussed all these influences most interestingly.

To sum up the principal factors favoring thrombosis there are, first, inflammation of the vein wall, a factor of great potential importance, little understood as yet, and undoubtedly influenced by advancing years, secondly, changes in the blood itself, whether in the nature of depletion or related to the obscure influence of trauma, and thirdly, the slowing of the venous return from the legs, dependent upon confinement to bed and aggravated by increased abdominal tension. Such factors tend to cause thrombosis in certain especially susceptible vessels, notably the femoroiliac veins and those of the calf and popliteal space.

VARIETIES OF THROMBOPHLEBITIS

These I have fully described elsewhere, so that I shall merely comment upon their individual peculiarities.

Phlegmasia Alba Dolens, Femoroiliac Thrombophlebitis, or Milk-Leg This very common form commences in the upper femoral and external iliac

vein. It leads to edema of the entire limb, but doubtless the severity and duration of the swelling depend on the amount of the venous tree occluded. It must be supposed that the less extensive the thrombosis, the more quickly and completely will

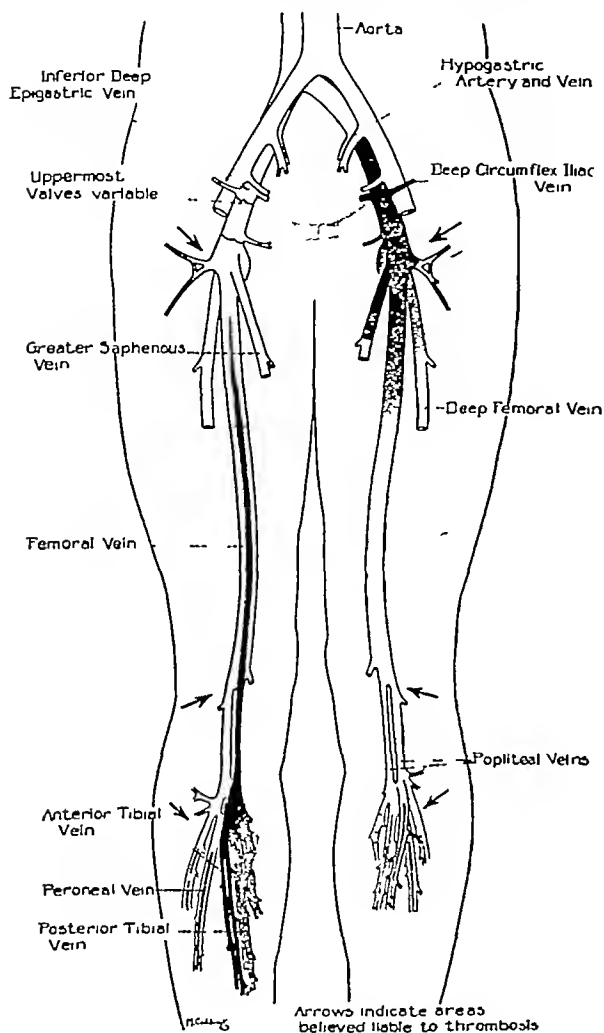
ly, to be sure—during active life. Moreover, it now seems probable that thrombosis begins much nearer the time of the operation, childbirth, injury or confinement to bed than was formerly supposed, that is, instead of coming on ten days or two weeks afterward, it is more nearly simultaneous with the onset of the exciting factor. Recently a patient of mine died of embolism from a femoroiliac thrombosis* on the day after an abdominoperineal operation, and there was suggestive evidence that the embolism actually occurred while he was still on the operating table. Possibly the time required for the initial thrombosis to lead to an extensive and obvious venous occlusion is longer than has heretofore seemed likely. Probably this time is decidedly variable. One can say definitely that when the entire leg is edematous, a fully developed femoroiliac thrombosis is present. But the absence of swelling does not rule out thrombosis.

One particularly interesting feature is the variation in the position and severity of the initial pain. It is sometimes severe enough to suggest serious arterial ischemia, a state which is even more definitely indicated when the arterial pulses in the foot become feeble or disappear. Such a state supports the hypothesis of a perivascular inflammation in the etiology of the disease. And of course a moderate fever and elevation of the pulse rate are very common.

Once a thrombophlebitis is established, the patient seems to become as it were thrombophilic. The other leg is involved far oftener than is generally supposed, but perhaps with so little swelling that the second process is overlooked. Occasionally a thrombophlebitis passes back and forth, recurring in the leg first attacked. Aschoff indicates that in a bilateral process the thrombosis ascends on the left at least to the point where the hypogastric artery crosses the external iliac vein, but on the right only to the inguinal ligament.

As to treatment, it is enough to say that elevation of the lower limbs above the level of the body for the purpose of drainage is essential, and that the affected leg should not be immobilized but exercised gently at the earliest possible moment. The thrombosis ends proximally well within the pelvis. It is very unlikely that a propagating thrombus is present. If present, it will presumably become detached whether or not the patient remains quiet. If it is not present, the proximal end of the thrombus will probably be healed by exercise and an improved circulation. Once edema has disappeared, the use of the limb, first in an elevated

* A fresh thrombophlebitis was found at autopsy in the external iliac vein. The embolus need not necessarily have come from there. Neither leg was swelled.



The Veins of the Lower Extremities (anterior view, semidiagrammatic). The areas most liable to thrombosis are indicated by arrows. On the left, a thrombosis in two of the great plexuses of the calf has extended into the femoral vein as a long, propagating thrombus (reconstruction from an actual case of fatal pulmonary embolism). On the right, the thrombosis of phlegmasia alba dolens is represented as ending cleanly where the hypogastric artery crosses the external iliac vein, the peripheral extent of the process is intentionally left vague.

a collateral circulation be established, and the more widespread the thrombosis, the more serious and prolonged will be the obstruction. Edema rather than blueness seems to measure the severity of the process. It is beginning to appear that a deep femoral or iliac thrombosis may be present without swelling, and Barker has shown that it can even establish itself—though rare—

and then in a dependent position, may gradually be resumed. For some months a bandage or elastic stocking for the lower leg is often required.

Deep Peripheral Thrombophlebitis Thrombosis in the Calf Muscles This treacherous disease has been little described. Its anatomic features are illustrated on the left in the accompanying sketch. Some of the great plexuses among the muscles of the lower leg become thrombosed. A very extensive process causes swelling and perhaps cyanosis of the ankle, or even of the calf. But as a rule the disease is very silent. The exciting cause is usually some minor injury or strain of the lower leg or foot. Following this, there is a little soreness of the calf muscles on use, especially on going upstairs. The ankle swells slightly. Merely going to bed often causes all signs of the disease promptly to disappear. There is no tenderness and only perhaps a little soreness on stretching the Achilles tendon. As a rule, elevation causes the proximal end of the thrombotic process to heal, but occasionally on renewed use of the leg the whole picture reappears. This suggests extension of the thrombosis and the possibility that a propagating thrombus has formed. Indeed, it appears that embolism from such a disease is far commoner than from a femoriliac thrombosis, yet I cannot agree with Aschoff that an embolus long and large enough to cause death can come only from the femoral region.

Repeated examinations are required in order to determine the frequency with which thrombosis occurs in the deep veins of the lower leg. My impression is that it is much commoner than is generally supposed, that it almost never merges into a femoriliac thrombosis, and that it usually heals on proper treatment, but that it is a relatively common source of pulmonary embolism. How often the femoral vein should be divided to forestall such an accident, I have no means of knowing, probably only when elevation is not followed by the permanent relief of symptoms*. Elevation is best obtained by raising the foot of the bed 15 cm and placing the unbandaged leg on a soft pillow. After ten days or so the leg is exercised freely in bed, and a semielastic bandage is used as life in the upright position is gradually resumed.

Superficial Thrombophlebitis in Non-Varicose Veins This is a freakish disease, which includes phlebitis migrans. A tendency to superficial thrombosis is perhaps familial, and some individuals are subject to recurrent attacks. Like other forms, it is decidedly common in the legs. A migrating

phlebitis is oftenest seen in those suffering from thromboangitis obliterans. Injuries and perhaps exposure to cold seem to be exciting causes of the more definitely localized processes. Such as these are obstinate in resolving, and tend to spread if the patient leads an active life or remains sitting up in bed. They disappear rapidly on elevation. For those which occur at or above the knee, high division of the great saphenous vein may usefully be combined with elevation. Fatal embolism is rare, but pulmonary infarctions occasionally occur.

Thrombophlebitis in Varicose Veins This is the least obscure and least interesting of the thromboses. The wall of the varicose vein is fibrosed and badly nourished. Very often its intima is cracked by unusual strains. Even without one's invoking the presence of infection in tissues of lowered resistance, there is sufficient reason for a considerable incidence of thrombosis in varix. That high pressures in the standing position are the usual cause of thrombosis in the slowed or reversed current is sufficiently proved by the fact that a varicose thrombosis is common in those who are active but rare in the bedridden. Once started in some pocket or distended area of a varicose vein, the thrombosis progresses until it meets a vigorous current. Thus it often reaches the femoral vein, which, however, it does not enter. Nor is embolism any but a rare occurrence. Infarctions I have seen, but not one fatal embolism.

Treatment of thrombosis in a varicose vein virtually ignores the possible detachment of an embolus. If the thrombosis is localized in the calf, an elastoplast bandage can be applied, and the patient allowed to go about his business. It is astonishing how rapidly under these conditions a cure occurs. If the process has reached the groin, elevation of the leg, as in other thromboses, is effectual. On the other hand, if high division of the saphenous vein above the thrombosed area can be accomplished, the immediate cure is more rapid and a recurrence is forestalled.

DISCUSSION

I have briefly discussed the treatment of the various sorts of thrombophlebitis in order to emphasize my conviction that thrombosis is encouraged to spread by slowing of the current of blood in and near the thrombosed vein, and is checked and healed when a vigorous venous return is created in the diseased part. In the vital matter of prevention, it would be ridiculous not to carry this conviction into action. I have noticed with interest and pleasure that one of my colleagues, with whom I have discussed the high incidence of pulmonary embolism following prostatectomy, is elevating the

*Femoral division below the profunda femoris, promptly performed would insure against embolism in all cases. So far as the venous circulation is concerned, the operation is harmless. Shall it be carried out in ten cases to save one or two?

foot of the bed following this operation. His practice is to raise it 15 cm for at least one half of each twenty-four hours. There is thus no bending at the groin and the feet are raised above the thorax. An extra pillow under the neck and head is of course allowed. That a similar course can be usefully followed in the pelvic surgery of women is proved by a recent publication of Schmid. In a series of 500 cases he shows that when postoperative elevation (25 cm) of the foot of the bed was used, thrombosis and fatal embolism disappeared, as against an expected incidence of from 12 to 23 thromboses and from 2 to 7 embolisms when a similar number of patients are kept flat in bed or allowed to recline. Indeed, no *reclining* during life in bed has been allowed in the present series. Routine precautions previously devised were naturally continued.

Now, in the attempt to forestall postoperative thrombosis, measures directed against dehydration and increased abdominal tension are common-sense precautions, if preferred, Bancroft's dietary regime and sodium thiosulfate to correct a high clotting index can be used. But is it advisable to keep patients subjected to upper abdominal operations, to say nothing of those having weak hearts and failing circulation, for long periods with their feet higher than their heads? Probably not, but perhaps for short ones—say from two to six hours in every twenty-four. Even a little help for the venous return is worth while. There is a tendency nowadays to work the modern adjustable bed to extremes, and to overemphasize the advantages of the half-sitting posture. This may partly account for what seems to be an increased incidence of thrombosis in the lower limbs.

As to the period at which preventive measures are most needed, I have already suggested that thrombosis follows more closely upon the exciting factor of trauma than has been generally believed. Best and his associates, in testing the effect of purified heparin on human beings, start its administration only an hour or two after operation. A similar course is being followed by Crafoord, of Stockholm. He first gives heparin three hours postoperatively and continues its use for four days. The period covered seems to me the one during which thrombosis is most likely to begin.

The treatment of established thrombosis, in order to be consistent with the foregoing conception of its onset and progress, must hurry the return of blood from the lower limbs and pelvis. Thus it should include especially elevating* the foot of the bed and abolishing the reclining position still so often used, applying heat rather than cold (I

have seen frostbites from the application of ice bags!), and permitting a reasonable freedom of motion rather than immobilization. If this kind of treatment appears to ignore the danger of embolism, the reason is plain enough. The only sure proof that a propagating thrombus, threatening fatal embolism, is present, is the onset of pulmonary infarctions. If such occur, an attempt to divide the vein proximal to the waving, fragile thrombus is in order. But if, as is usually the case, the dangerous propagating thrombus is silent until its fatal detachment takes place, I submit that rather than attempt to prevent this detachment by immobilization—which of course is futile, since even the patient's use of the bedpan is an athletic feat—the influences most likely to prevent its *formation* should be tried, namely elevation and mobility, or at least absence of immobility. It is not the turning over in bed that causes the fatal embolism, but rather the creation of a propagating thrombus in the slowed venous current which happened many hours, or more likely many days, previously.

A few words on the relation to pulmonary embolism of thromboses about the prostate, particularly in elderly men, and about the uterus and vagina should be mentioned. Such thromboses are probably common, and have often been shown to progress into the iliac vein, where they are a cause of phlegmasia alba dolens. In this form they are very unlikely to be a source of embolism. The question is rather whether they may, from a small and perhaps undetectable beginning, become the insecure anchoring point for a propagating thrombus which occludes no large vein but which floats through the hypogastric into the common iliac vein and is detached nearly or entirely in toto. Vain searches at autopsy for the source of long pulmonary emboli (from 25 to 30 cm) tempt one to say "Yes." Obviously more evidence is required. My own feeling has been that the popliteal region and upper calf are more likely to be the site of the long, folded thrombus such as is usually found fixed in the pulmonary artery in a fatal case of embolism. Even when autopsy reveals pronounced thrombosis in the veins of the pelvis, or perhaps the left external iliac vein, the source of embolus may still be an unnoticed process in one of the great plexuses of the calf. Such considerations suggest that more embolism occurs from undiagnosed than from evident, established thromboses.

* * *

I have taken the attitude that thrombophlebitis results from a combination of several factors, among which a slowed current, trauma and certain anatomic relations are pre-eminent. I have

*The treatment of a local varicose thrombosis by an elastic bandage and full use secures an active venous return without elevation.

ignored in the discussion of both etiology and treatment the possibility that the thrombocyte may be restrained by chemical means from throwing himself down to die in tempting locations. I am sure that since Best and his associates in Toronto have taken up the problem of forestalling thrombosis and even treating its established forms by the use of purified, nontoxic solutions of heparin, you will hear encouraging accounts of investigations along this line. Whether or not these prove fruitful, there is no harm in keeping in mind the fundamental principles relating to the etiology, progress and treatment of thrombosis.

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BENIGN STRICTURE OF THE ESOPHAGUS COMPLICATING DUODENAL ULCER

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ESOPHAGEAL stenosis is a rare complication of duodenal ulcer. Our purpose in reporting the following case is to call attention to this complication, and to emphasize the importance of treatment by esophagoscopy under local anesthesia, with bouginage by direct vision.

CASE REPORT

R. T. (U 22312), a 56-year-old, native-born clerk, first entered the Baker Memorial Hospital on February 16, 1937, complaining of epigastric pain and hematemesis. The pain was of 5 years' duration and was relieved by a bland diet and powders. The hematemesis was of a few days' duration 1 year previously, and of 5 days' duration at the present attack. Physical examination on admission showed a poorly developed, pale, emaciated man with dry skin and tongue. The blood pressure was 100/40. The red blood-cell count was 3,410,000, the hemoglobin 60 per cent, and the white-cell count 14,800. Two stool examinations were positive for occult blood. The patient was put on hourly feedings of milk and lime water, and a 500-cc. citrate transfusion was given. On this regime the bleeding stopped and the patient improved enough for x-ray examination 1 week after admission. The x-ray report by Dr. J. R. Lingley was as follows: "The esophagus appeared normal. The stomach showed generalized prominence of its rugae. The duodenum was constantly deformed. Projecting from the superior anterior margin of the cap there was a large, deep, penetrating ulcer crater." Re-examination 1 week later showed the ulcer to be smaller than formerly thought, measuring only 3 mm. in diameter. On March 4 the patient was discharged home relieved on a six meal, bland diet.

Because of a recurrence of vomiting the patient was readmitted on April 1, 1937. There had been no further

hematemesis, but the red-cell count was only 2,500,000, and the hemoglobin 50 per cent. Two transfusions were given. On April 6 he was still vomiting coffee ground material. On April 9 operation was performed by one of us (E. M. D.) and a gastric resection with posterior Polya anastomosis was done. Five days after operation there were some distress and gastric accumulation but no vomiting. A nasal tube was passed into the stomach twice a day for 4 days and then left in place for 2 days. A 500-cc. citrate transfusion was again given, and fluids were given intravenously. It was apparent that the stoma was not functioning as there was a daily increase in the gastric output. Twelve days after the gastric resection a second operation was done under local anesthesia. At operation the stoma was normal but there was a distinct kink in the distal loop of the jejunum. An enteroenterostomy was done, following which the patient made a rapid, uneventful convalescence, and was discharged home on May 8.

He was admitted for the third time on September 2, 1937. One week after arriving home, about 3½ months previously, the patient began to experience difficulty in swallowing semisolid foods, and limited his diet to egg-nogs and other liquids. He began to lose weight. One month prior to entry it became impossible for him to swallow anything except water and ginger ale. His weight on this admission was 93 lb., a loss of 37 lb. since his first admission 6 months previously, and a loss of 20 lb. in the past month. Physical examination showed an exceedingly dehydrated, emaciated man, retching and vomiting saliva. Constant intravenous fluids were begun at once. X-ray examination of the esophagus (Fig. 1) was reported as follows by Dr. Lingley: "Barium met almost complete obstruction in the lower third of the esophagus, where the lumen was reduced to a very fine tube for a distance of about 5 cm. The upper margin of the defect was cone shaped, and its lateral margins finely irregular. An ulcer crater, however, was not visualized and there was no filling defect suggestive of cancer. After 1 hour only a very small trace of barium had reached the stomach and the esophagus above the lesion was mod-

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crately dilated. The findings are those of a stricture in the lower third of the esophagus, probably due to a benign peptic ulcer" (Plates taken on the first admission had shown a normal esophagus)

Esophagoscopy under local anesthesia was performed by one of us (E B B) on September 8. About 1 cm above the stricture there was marked reddening and inflammation of the esophagus. The opening of the stricture was almost obliterated. There was no evidence of ulcer or carcinoma. Under ocular guidance a No 8 French silk-woven esophageal bougie was directed into the lumen and



Figure 1. X-ray of the esophagus before treatment, showing almost complete obstruction in the lower third.

passed readily into the stomach. That the narrowing was due largely to esophagitis was soon evident, for once the lumen was established bougies up to No 16 French passed readily. Following this the patient was able to take small amounts of liquids by mouth. Two days later, esophagoscopy was repeated under local anesthesia, bouginage was carried out as before up to a No 16 French, and a soft duodenal tube (No 14 French) was introduced through the stricture into the stomach. Feedings were then given through the tube. Four days later esophagoscopy was again done under local anesthesia, bouginage was carried out up to a No 22 French, and a No 18 French duodenal tube was placed through the stricture. Intravenous fluids were discontinued and liquids, including beef juice, fruit juices and milk, were given through the tube. In spite of a low serum protein (4.9 gm. per cent), there was never any sign of nutritional edema. Three days later a fourth esophagoscopy was done as before, the esophagitis was found to be almost entirely healed, and the stricture was dilated to a No 24 French bougie. No feeding tube was placed and the patient began eating soft solids without difficulty. At two subse-

quent esophagoscopies on September 21 and September 27, a small (7 mm) esophagoscope was passed through the stricture into the stomach.* Following the last esophagoscopy a lumen was obtained which permitted a six meal bland diet of minced meat and strained vegetables. From then on convalescence was rapid, there was a gain in weight of 11 lb in the 22 days following the first esophagoscopy, and a marked gain in strength. The patient was allowed up and about the ward, and was discharged home on September 30, with instructions to return for further dilatation to maintain and increase the esophageal lumen. X-ray examination (Fig 2) at the time of discharge was reported by Dr Lingley as follows: "The stricture in the lower third of the esophagus has diminished in length and the lumen has definitely increased since the last observation. Barium now passes with only slight delay."

Esophageal stenosis as a complication of peptic ulcer of the stomach or duodenum has been reported by Vinson¹ and C. L. Jackson.² The co-existence of peptic ulcer of the esophagus and gastric or duodenal ulcer has also been reported (Abel,³ C. Jackson,⁴ and Friedenwald, Feldman



Figure 2. X-ray of the esophagus after treatment, showing free passage of barium through the stricture.

and Zinn⁵). In the case reported here no esophageal ulcer was demonstrable. In a study of 40 cases of cicatricial benign stricture of the esophagus of unknown origin Vinson reports 2 cases associated with duodenal ulcer. In C. L.

At the last examination a piece of tissue appeared to be lying free in the lumen of the esophagus at the site of the stricture. This was removed with forceps for pathological examination. The report was cellular exudate.

Jackson's report of 3 cases of esophageal stenosis associated with ulcer of the stomach and duodenum, 2 showed esophageal ulceration and 1 showed benign organic stenosis without peptic ulcer of the esophagus. The absence of substernal pain in our patient and the appearance of the esophagus by x-ray and by esophagoscopy make it probable that we were dealing with a benign cicatricial stenosis following acute esophagitis. Guisez,⁵ quoted by Friedenwald, Feldman and Zinn,⁶ is convinced that many of the so-called simple ulcers of the esophagus are actually only localized inflammatory processes which finally terminate in stenosis without undergoing definite ulceration. As to the cause of the esophagitis in this case and the few similar ones reported, vomiting or regurgitation of acid gastric secretions may be of importance. Infection of the esophagus from the gastric or duodenal ulcer either directly or through the lymphatics may be a factor. The general nutritional state of the patient may also play a part. Bartels,⁶ in a pathological and clinical study of 82 cases of acute ulcerative esophagitis, found gastric contents in the esophagus in all cases at necropsy. He did not discuss peptic ulcer of the esophagus, but esophagitis with phlegmonous or superficial ulcerations and erosions. In his opinion

It seems imperative that the action of the gastric juice be accepted as contributing to the lesion, because gastric juice was present uniformly in the lower third of the esophagus. Vomiting and even nausea without vomiting with relaxation of the cardiac spasm, seem extremely important as factors that permit gastric juice to come in contact with the esophagus. It seems necessary that the patient should be debilitated, but not necessarily dying before changes can occur in the esophagus. Debilitating and terminal states imply slowing of the circulation of the lower part of the esophagus, which normally is poor, and therefore loss of the normal resistance of esophageal tissue to trauma, and of its ability to regenerate.

In our patient vomiting was not a prominent symptom either before or after operation, although there were high jejunal obstruction, gastric distention, and probable regurgitation of gastric secre-

tions into the lower end of the esophagus. Debilitation, however, was very marked. As to the etiologic importance of an in-lying gastric catheter, we do not believe it to be a factor, as it is so commonly used before and after gastric surgery without untoward results. In this connection Bartels concluded that passage of a tube is not an etiologic factor and may only incidentally be an aggravating one.

Symptomatically such patients may exhibit gas, substernal or epigastric distress, heartburn, nausea, regurgitation or vomiting, but as the esophageal lumen becomes narrow the outstanding symptom is difficulty in swallowing solid foods, and later with almost complete stenosis there is regurgitation of liquids. The diagnosis is easily made by x-ray and esophagoscopy.

The treatment should be esophagoscopy under local anesthesia, with bouginage under direct vision through the esophagoscope. Local anesthesia is used because general anesthesia is not only unnecessary but also dangerous in debilitated patients. Bouginage should be carried out under ocular guidance through the esophagoscope because, as Jackson and Jackson⁷ have repeatedly emphasized, "blind bouginage should be discarded as an obsolete and very dangerous procedure."

SUMMARY

A case of benign stricture of the esophagus, probably due to an acute esophagitis following gastric resection for duodenal ulcer, is reported.

The etiology, symptomatology, diagnosis and treatment are briefly discussed.

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HYPERVENTILATION TETANY

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PROLONGED hyperventilation, whether practiced voluntarily in the laboratory or occurring as the result of some pathologic state, produces certain physicochemical changes that lead to tetany. The earliest observations on this subject were made between 1908 and 1912, when Haldane and Poulton,¹ Henderson,² Edsall³ and others found that during experiments on hyperventilation their subjects complained of dizziness, tingling of the fingers and toes, and rigidity of the hands. In 1920, Collip and Backus⁴ and, independently, Grant and Goldman⁵ confirmed these findings and recognized the symptoms as those of tetany. Two years later, clinical reports of tetany caused by hyperventilation first appeared.⁶⁻⁷ Since that time there have been numerous case reports and considerable experimental work on the subject. In this paper the clinical syndrome will be discussed and some illustrative cases will be presented. But first it is necessary to outline the important chemical and physiologic changes produced by hyperventilation.

PHYSIOLOGY

Forced respiration causes a sharp drop in the carbon-dioxide tension of alveolar air.^{1,4,6} As a result, an increased amount of carbon dioxide is washed out of the blood, and there is a drop in the carbon-dioxide content of the plasma.^{4,6} An increase in the pH of the plasma and a state of alkalosis accompany this change. At the same time there is an increase in the pH of the urine and a suppression of the output of urinary ammonia. These alterations in acid-base equilibrium have been constantly recorded in investigations on hyperventilation. Numerous other changes have been reported. Some observers have noted a slight increase in the concentration of serum calcium,⁴ while others have noted no change.^{8,9} A marked drop in the concentration of serum inorganic phosphorus has been noted.⁸ Several investigators have observed a rise in concentration of blood chlorides,^{10,11} and others have noted a decreased concentration of blood sodium.¹² Acetone frequently appears in the urine.^{8,10} In one experiment¹³ a drop in cerebrospinal fluid calcium was reported, but this finding was not confirmed by other investigators.^{9,14}

In addition to the alterations in blood chemistry, various other phenomena have been observed. A

period of involuntary apnea² frequently follows a period of forced respiration. Breathing is not resumed until the level of plasma carbon dioxide has risen to the point where the respiratory center is stimulated. A diuresis often follows hyperventilation.⁴ There is usually noted a drop in systolic and diastolic blood pressures.¹⁵ The pulse rate is increased. Experiments on dogs indicate that there is no attendant depression of the circulation.¹⁶ The changes in the electrocardiogram are very slight; most observers report that the R waves and T waves have a smaller amplitude during forced breathing.¹⁷ Several phenomena appear which are common to this and other types of tetany. There is an increased electrical excitability of peripheral nerves.¹⁸ Chvostek's sign and Trousseau's sign are regularly present.

Although it is not my purpose to discuss the pathogenesis of hyperventilation tetany, some comment on the blood chemistry is pertinent from the therapeutic standpoint. Attacks of this type of tetany can be stopped by the administration of 5 per cent carbon-dioxide inhalations, by re-breathing and by the patient's holding his breath. All these have the effect of raising the carbon dioxide content of the plasma, and thus simply reverse the changes produced by hyperventilation. Similarly, the administration of ammonium chloride, which decreases the pH of the blood without necessarily altering the carbon-dioxide content, tends to prevent hyperventilation tetany. Finally, attacks of this type of tetany have been immediately aborted by the intravenous injection of a calcium salt more alkaline than the blood.¹³ It is thus possible that the decreased carbon-dioxide content and the increased pH of the plasma in hyperventilation produce some change in the blood calcium which causes tetany.

CLINICAL CONSIDERATIONS

Hyperventilation is seen in a wide variety of clinical conditions. Among the neurologic disorders it is seen most frequently in encephalitis lethargica.⁶ Hyperventilation is not an uncommon response to pain,⁷ and is occasionally seen during ether anesthesia.¹⁹ Shannon²⁰ has produced evidence that, in certain cases, tetany of the newborn is due to hyperventilation. In cases of alkalosis of other origin, a slight amount of hyperventilation may precipitate an attack of tetany.¹¹

Hyperventilation tetany is frequently seen in

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pregnant women²¹ In this connection it is interesting to note that there is normally an increased pulmonary ventilation and a decreased carbon-dioxide content of the plasma during pregnancy. However, the casual relation of these facts has not been definitely established.²²⁻²³

By far the largest number of reported cases of hyperventilation fall in the group of psychoneuroses. Of these, anxiety neurosis and hysteria²⁴ appear to be the commonest, but hyperventilation is also a frequent response to rage, sorrow, fatigue, excitement and apprehension. Tetany has occurred during operations under local anesthesia,²⁵ after attacks of asthma²⁶ and after athletic events.⁹ A more complete review of the literature would doubtless disclose many other factors which have precipitated tetany. The references cited here are given merely to show how frequently and under what varied circumstances hyperventilation and tetany may occur.

SYMPTOMATOLOGY

There is considerable variation in the symptoms reported by patients and laboratory workers suffering from hyperventilation tetany. Most patients complain first of dizziness, accompanied by numbness and tingling of the fingers and toes. Blurring of vision and tightness in the throat are frequently noted. There may follow difficulty in speaking, tightness across the upper chest or over the precordium, and spasm of the hands and feet. Twitching of the facial muscles may also occur. In very severe cases laryngeal stridor, generalized convulsions, opisthotonos and unconsciousness may occur. Usually, however, the tetany does not progress beyond the point where spasm of the hands appears. In many cases malaise, weakness and helplessness are prominent features. The patient falls to the ground as if in a faint, but consciousness is clouded little or not at all. Occasionally the patient becomes very frightened and has a feeling of impending death. Some patients learn from oft-repeated attacks that there is nothing to fear.

In any individual case, it will be found that many of the symptoms outlined above are not present, but almost without exception numbness and tingling and a certain amount of malaise or dizziness are present. Attacks vary greatly in duration, lasting from a few minutes to several hours. As the symptoms subside, the patient notices a physical and nervous fatigue which is proportional to the severity of the attack, and which may last for several days.

DIAGNOSIS

The diagnosis is not difficult. In most cases the increased rate or depth of respiration is obvious.

There is a striking absence of the signs of cardiac or pulmonary disease. Chvostek's sign and Trousseau's sign are present, and the patient may exhibit typical carpopedal spasm. In certain cases, however, the hyperventilation is not at all obvious. A patient may have very slightly increased ventilation over a long period of time, and develop tetany without any marked increase in respiration. Or a patient may not be observed until the attack is subsiding and hyperventilation has ceased. In either of these cases a diagnosis of hyperventilation tetany may be confirmed by asking the patient to overbreathe vigorously for a few minutes. The patient reports a rapid return of symptoms identical with the symptoms of the attack, and the signs of tetany become apparent much sooner than would be expected in a person whose acid-base balance had not previously been disturbed. This test is quite harmless. Besides establishing the diagnosis, it is a dramatic way of pointing out to the patient the source of his trouble.

Several other conditions should be excluded. In the first place, tetany due to low serum calcium is to be considered. If the serum calcium is normal, tetany due to rickets, osteomalacia, hypoparathyroidism, steatorrhea and renal failure may be ruled out. Secondly, alkalosis from other causes should be considered, since tetany may occur after repeated vomiting and after excessive ingestion of alkalis. Finally, the possibility that the hyperventilation is due to a lesion in the brain must be recognized.

CASE REPORTS

Case 1 (M. G. H. No. 341569) R. P., a 21-year-old, single, white woman, was admitted to the hospital in October, 1934, complaining of intermittent attacks of weakness and collapse. She had been perfectly well until 1931, when she had had her first attack. This started suddenly, with dizziness, blurring of vision and frontal headache. She felt weak in the arms and legs, and noted numbness and tingling in the fingers and toes. The weakness progressed until, no longer able to stand, she fell to the ground crying uncontrollably. She remained fully conscious, but found that she was unable to speak, attempts to do so bringing forth only unintelligible sounds. Gradually her symptoms subsided, her vision cleared, and the numbness and tingling disappeared. She remained weak for several hours, and complained of extreme muscular fatigue.

After this first episode, the patient had similar attacks at irregular intervals, varying from 2 weeks to 3 months. The duration of attacks ranged from 10 minutes to 1½ hours. Attacks usually occurred at times of excitement or during emotional upsets. On two occasions the patient collapsed while swimming. At no time was there any loss of consciousness, convulsions or incontinence. Between attacks she felt well, and there were no other symptoms. Her past history and family history were negative.

Physical examination was essentially normal. The blood pressure was 132/88. A neurological examination was negative. Routine examinations of the blood and urine were within normal limits. The spinal fluid contained

50 red blood cells per cu mm and a protein of 51 mg per cent. The basal metabolic rate was -4 per cent. X ray of the skull was negative

The patient had an attack a few minutes after the metabolism test was completed. She complained of weakness, malaise and tingling in the fingers and toes. She began crying in a hysterical fashion and was soon unable to speak, although she was able to understand questions and to answer by shaking her head or nodding. During this attack her color was good. She was very restless, and threw herself about on the bed, crying constantly. Her respirations were markedly increased. The blood pressure was 160/110, and the pulse 90. Chvostek's sign was present, and Trousseau's sign was elicited 20 seconds after applying the tourniquet. The patient's condition remained unchanged for 30 minutes. At the end of this time venous blood was removed for analysis, and she was given 10 cc. of a 10 per cent solution of calcium gluconate intravenously. She experienced immediate symptomatic relief. The venous blood sugar was 101 mg per cent. The serum calcium was 11.0 mg, and the serum phosphorus 2.2 mg per cent. On the following day the serum calcium was 10.2 mg, and the phosphorus 4.0 mg per cent.

Further studies on this patient revealed that she reacted to any emotional situation by increased rate and depth of respiration. Excitement of any sort, pleasant or otherwise, provoked the response of hyperventilation. Except for this type of response and a tendency to become easily excited, she appeared well balanced. She gave the impression of being genuinely eager to be cured.

The treatment consisted simply of an explanation of the mechanism of her attacks. To illustrate the validity of this explanation she was asked to breathe rapidly for a short period. A typical attack was thus induced in 6 minutes. A paper bag was then placed over her head and secured loosely about the neck. She continued to breathe rapidly, but her symptoms subsided in a few minutes.

The patient was discharged with instructions to observe and control her breathing, especially in moments of stress, and to hold her breath or rebreath into a paper bag if an attack occurred. Three years later (October, 1937) she wrote to say that she had had no further severe attacks. She had continued to have occasional tingling of the hands, but had been able to prevent the development of further symptoms by holding her breath.

Case 2.* Mrs. J. W., a 54-year-old housewife, had suffered from intermittent attacks of collapse since the age of 23. These attacks varied greatly in duration and intensity, but a typical seizure was as follows. There was a sudden onset of extreme fatigue and depression, and the patient felt like lying down at once. This was quickly followed by blurring of vision, and numbness and tingling of the hands and feet. A sudden weakness of the legs caused her to collapse on the floor, where she lay fully conscious but unable to move or speak. At the same time she noted a sense of pressure on the upper part of her chest, and complained of a smothering sensation which caused her to gasp. As the symptoms subsided she felt little desire to breathe at all. After the attack the patient felt very weak, and was quite fatigued for several days.

Similar attacks occurred on an average of every 3 months, although occasionally the patient was symptom-free for nearly a year. Recently attacks had become increasingly frequent and severe, and varied in duration from 30 minutes to 5 hours. On one occasion a doctor observed spasm of the hands. It was frequently noted

that her pulse was feeble and her breathing was irregular. At the height of one attack her respirations ceased altogether for several minutes. When her symptoms were particularly severe she appeared to be "practically unconscious," and retained only a vague recollection of the episode. On several occasions a marked diuresis followed an attack.

The family history and past history were negative. At the age of 28 a cholecystectomy was performed. At 33 a small uterine fibroid and the appendix were removed. After this operation the surgeon told her that she had taken the ether "very badly" and warned her against further anesthesia.

Between attacks the patient enjoyed robust good health. She played golf regularly and was active in social affairs. Her obvious well being in these intervals, coupled with the apparent seriousness of her attacks, puzzled her physicians. The patient noted that her attacks always followed a period of unusual activity or emotional stress, it was when her social calendar had been particularly full that she succumbed. She gave the impression of being calm, well adjusted and energetic.

On April 28, 1936, the patient had a typical attack in my office. Suddenly complaining of dizziness and tingling of the hands, she threw herself on the couch as though completely exhausted. Her color was good. She was breathing deeply at the rate of 30 respirations per minute. The pulse was 90 and of good quality. The blood pressure was 140/90. The heart sounds were normal, and the lungs were clear. Chvostek's sign was present, and Trousseau's sign was elicited in 40 seconds. The patient was instructed to hold her breath. She did this for 2 minutes without apparent difficulty and noted that her symptoms abated considerably. She was then asked to breathe rapidly. Her symptoms quickly returned, but again subsided after a paper bag had been placed over her head.

On the following day she still complained of fatigue, but had no other symptom. The blood sugar was 103 mg per cent, and the serum calcium 9.7 mg. She was discharged with instructions for regulating her breathing. For 18 months she had no severe attack, although occasionally the warning symptoms of fatigue and blurring of vision occurred. In October, 1937, she had a fairly severe attack, following several weeks of overactivity and nervous strain.

Cases 1 and 2 are nearly identical in that hyperventilation was a constant and unconscious response to emotional stimuli and fatigue. Severe attacks of collapse occurred irregularly over a period of years, and interfered to a considerable extent with activity. In neither case was there an obvious neurotic background to the overbreathing. In Case 1 the attacks ceased when the method of preventing them had been explained to the patient. In Case 2 there was only one severe attack in the subsequent eighteen months. It is apparent, however, that neither patient became sufficiently aware of the importance of hyperventilation. The transient episodes of dizziness and tingling of the extremities, occurring under circumstances that previously had preceded a major attack, indicated that these patients continued to respond to certain situations by overbreathing.

*The author is indebted to Dr. Roy R. Wheeler for permission to publish the report of this case.

Case 3 (M. G. H. No. 55942) N. F., a 17-year-old boy, was referred to the Out Patient Department of the Massachusetts General Hospital with a diagnosis of tetany due to overventilation. Six months before admission he began having attacks of severe precordial pain accompanied by dizziness, sweating, numbness and tingling of the hands, spasm of the hands, twitching of the face and shortness of breath. The attacks lasted from 30 minutes to 2 hours, and left him with a sense of extreme weakness and fatigue. Attacks occurred almost daily, and were of such severity that his doctor advised complete bed rest. His attacks continued unabated. The patient developed a constant precordial ache, which became a sharp constricting pain during the attacks of spasm. Temporary relief was afforded by the intravenous injection of a solution of calcium levulinate. Later the patient was given calcium salts and ammonium chloride by mouth, and spasm of the hands no longer occurred during attacks. Otherwise his condition remained unchanged.

The family history and past history were negative. At physical examination the patient was well developed and appeared healthy. He was extremely nervous and tense, and was unable to sit quietly. He was breathing deeply and rapidly, because he felt short of breath, unable to get a deep breath. The heart and lungs were normal. The blood pressure was 160/80. The pulse was 120. The knee jerks were hyperactive. Chvostek's sign was present, and Trousseau's sign was quickly obtained. The urine was neutral to litmus, and normal in other respects. The serum calcium was 11.0 mg per cent, and the serum phosphorus 2.42 mg. A blood Hinton test was negative.

The patient was asked to omit all medication and was given an explanation of his symptoms. He was advised to stop trying to get a deep breath, and to control his breathing at all times. One week later he returned to the clinic, and presented an entirely different appearance. He was calm and quiet. His blood pressure was 110/70. The pulse was 80. The tendon reflexes were normal. The signs of Chvostek and Trousseau could not be elicited. The patient had had no further attacks, and there had been no precordial ache. He stated that he had had no difficulty in controlling his breathing. In a letter 6 months later (November, 1937) the patient reported that he was still nervous at times, and suffered occasionally from shortness of breath, precordial pain and weakness. He had had no further attacks of carpal spasm.

The precipitating factor in this illness was a difficult family situation which apparently kept the patient in a state of tension that was reflected in his overbreathing. Anxiety about his condition and the precordial ache doubtless served to increase his hyperventilation once the state of tetany had been established. Although he derived some benefit from his visit to the clinic, his later course was determined more by his emotional conflict. In this case, as in Cases 1 and 2, the habit of overbreathing persisted, but was not so excessive as it had been. If these patients had been available for a thorough psychiatric investigation a more permanent and complete improvement might have been obtained.

In view of the variety of conditions in which hyperventilation tetany can occur, it is probable that it is much commoner than is indicated by a

survey of the literature. That 2 of the cases reported above went undiagnosed for years is certainly an indication that the condition is not sufficiently understood by the practicing physician. The presence of carpal spasm undoubtedly points the way to a correct diagnosis in a large majority of cases. But in many instances, as shown in the 3 cases reported in this paper, incapacitating symptoms may develop in the absence of carpal spasm. Transient episodes of tingling of the extremities with a vague history of periodic attacks of collapse or "hysteria" should direct the physician's attention toward the possibility of hyperventilation. If an effort is made to see the patient during an attack, this possibility can be affirmed by the presence of the signs of tetany. Once the diagnosis has been made, it is possible to give the patient instruction in regard to proper breathing. In many instances he will learn to prevent the occurrence of further attacks.

SUMMARY

- 1 The chemical and physical changes occurring in hyperventilation tetany are briefly reviewed.
- 2 The clinical aspects of this condition are discussed.
- 3 Three cases in which frequent attacks of tetany resulted from overbreathing are presented. In each case, improvement resulted when the mechanism of the attacks had been explained but the patients continued to respond to certain situations by increased ventilation.

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CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITALANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24141

PRESENTATION OF CASE

A sixty-four-year-old, white, Italian barber entered the hospital with the complaints of anorexia and vomiting of two months' duration.

For twenty-five to thirty years before entry he had always had a poor appetite, and for the fifteen years before entry had had frequent attacks of nausea and vomiting. He was bothered greatly by gaseous distention and "gas pains," which came on directly after eating and were usually relieved by eructations. However, he frequently became nauseated and regurgitated or vomited the food he had eaten. The frequency of vomiting could not be determined, but it usually occurred after eating large amounts of food. Soda gave him no relief. He never vomited fresh or changed blood or passed tarry stools. For many years his bowels had been sluggish, and it had been necessary for him to take castor oil or other laxatives two or three times a week. If he did not take laxatives, his vomiting occurred more often.

About two months before entry he developed a dull, gnawing, aching sensation in his midepigastrium, which came on ten minutes to one and a half hours after eating and was usually relieved by vomiting. The aching sensation often radiated into both upper quadrants and occasionally through to the back. Gradually the vomiting changed to frank regurgitation of practically everything eaten or drunk. He was able to swallow successfully but could not lie down after meals because the food would "roll right out," practically in an unchanged state. During the two months before entry he had lost 22 lb and had become very weak and pale.

For fifteen or twenty years before entry he had had a chronic cough productive of moderate amounts of yellowish sputum. Most of the sputum was raised in the morning. It was never foul or blood streaked. For two or three years before entry he had a sensation of a "little ball" tickling the back of his throat. He had had no night sweats or persistent fever. His past history was otherwise essentially negative, and his family history was not contributory.

Physical examination revealed a fairly well-developed man, showing evidence of considerable weight

loss. The skin and mucous membranes were pale, and the tongue was heavily coated. The heart was negative, and the blood pressure was 110 systolic, 75 diastolic. At the right lung base posteriorly there were slight dullness and decreased tactile fremitus, voice sounds and breath sounds. Coarse rhonchi were heard in the right chest, which disappeared on coughing. There was an indefinite hard tender mass in the epigastrium just beneath the xiphoid, which was difficult to delineate because of spasm of the abdominal muscles. The mass seemed to extend into the right upper quadrant, and was thought possibly to be continuous with the liver. No definite liver edge could be felt and no other masses or spasm were made out. The rectal examination was negative.

The temperature was 97.5°F., the pulse 65. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,500,000 with 65 per cent hemoglobin, and a white-cell count of 31,500 with 88 per cent polymorphonuclears. The sputum was yellowish in color and contained gram-positive diplococci. The vomitus contained particles of food and gave a negative guaiac test. Gastric lavage was attempted, and the fluid obtained contained no free or combined hydrochloric acid and gave a 2+ guaiac test. The blood Hinton and a 1:40,000 tuberculin test were negative. The non-protein nitrogen of the blood was 45 mg per cent.

Fluoroscopic x-ray examination of the chest revealed a large mass projecting to the right from the upper mediastinum. The lung fields were otherwise clear, and the diaphragm appeared normal. Barium given by mouth filled a tremendously dilated esophagus, and the previously observed mass was seen to represent the esophagus almost filling the right upper chest. The dilatation was greatest in the upper portion of the esophagus but was also marked throughout the lower half. No barium passed into the stomach during fifteen minutes of fluoroscopic examination.

On the day following entry his temperature rose to 100°F and on the next day to 102°F. His respiratory rate increased to 35. Thorough lavage of the esophagus was done on several occasions and somewhat improved his condition. However, only very small amounts of fluid could get through the cardia. His temperature and respirations remained elevated, and on the sixth day definite signs of pneumonia could be made out at the right lung base. He died on the eighth day.

DIFFERENTIAL DIAGNOSIS

DR. CHESTER M. JONES. The story seems to me to present two possible diagnostic problems in addition to the obvious terminal pneumonia. In the first place we have a patient who has had for at

least fifteen years, and possibly twice that length of time, symptoms of esophageal obstruction with gradually increasing obstruction and gradual enlargement in the size of the esophagus. Anything that extends over such a period of time by itself cannot be considered a malignant lesion. Therefore, I should say that the symptoms and story were those of a benign obstructing lesion at the lower end of the esophagus. The x-rays show an enormous barium-filled tube that narrowed down in a funnel-shaped manner to the cardiac orifice. There is no mention in the x-ray report in the record that there is anything but a symmetrical or fusiform narrowing of the lower end of the esophagus. The mass that was first noted by x-ray might have been outside the esophagus or connected to it by a small opening. In other words, it might be a huge esophageal diverticulum under the right clavicle, filled with food and fluid, but it seems more reasonable to assume that the whole picture represents a tremendously enlarged esophagus. It is still possible that there was a diverticulum of the upper third, as a matter of fact the upper third is the weakest portion and does dilate readily if back pressure is put against it. So the x-ray findings fit perfectly well with an obstruction at the lower end of the esophagus and explain part of the clinical picture. I cannot conceive of this obstruction's having been due primarily to cancer at the cardiac end of the esophagus. Fifteen years of continuous symptoms without change in character would seem to indicate a benign process which was gradually increasing.

I suppose it is possible that this process could be a stricture due to previous trauma or to chemical injury following the ingestion of lye. It could be due to congenital narrowing of the lower end of the esophagus or a congenital hypertrophy of the cardiac end of the esophagus. These conditions do occur. We have seen as large an esophagus as this due to cardiospasm of many years' duration. I can recall one that had a story of at least twenty years' duration with a very large esophagus. They do not mention the actual content. I think the largest amount recorded is 1800 or 2000 cc. So far as the size of the dilated esophagus is concerned, any of these benign processes are possible causes, but they will not explain certain other findings. Obviously the man is dehydrated, undernourished and constipated because of lack of sufficient food. He is anemic because of malnutrition. His nonprotein nitrogen is elevated because of dehydration. The only unexplained laboratory finding is the leukocytosis of 31,000 with 88 per cent polymorphonuclears. That goes perfectly well with a pneumonic infection which is

not obvious on these plates but is suggested by the admission chest signs, and we know that he subsequently died with a clinical picture of pneumonia.

We are left with a story of chronic cough and yellow sputum. He may have had bronchiectasis, but the x-ray findings do not suggest any such possibility. This chest plate is an oblique view. It does not suggest a bronchiectatic process to me, nor does it suggest any real pneumonic process. I am not going to consider the story of cough and sputum as related to the main part of the history.

Two months before entry he gives a story of something new—epigastric pain coming ten minutes to one and a half hours after meals, usually relieved by vomiting. Here again we may be dealing with an overdilated esophagus with a certain amount of irritation at the lower end which is relieved by regurgitation. This symptom, however, seems to have a different significance from that of the earlier symptoms.

We have a physical finding which I think is extremely important, that is, an indefinite, hard, tender mass in the epigastrium just below the tip of the xiphoid. That does not go with esophageal disease unless it represents metastases from tumor. I have not seen a sufficient number of cases of cancer of the esophagus to know where they tend to metastasize. I should expect them to metastasize to the mediastinal nodes rather than below the diaphragm. The mass may be associated with the liver, of course, or it may be the stomach, but it has to be one of these organs.

It is entirely possible that we have to make two diagnoses, one of a benign process which is more or less obstructing the esophagus and has done so increasingly over a period of many years, and then a second process which has changed the symptoms recently and at entry is associated with a mass at the tip of the xiphoid. It may represent cancer of the stomach or just outside the stomach and in the liver. I do not believe he has tuberculosis, but the negative 140,000 tuberculin test does not rule it in or out. It is of some interest that the Hinton test is negative. It says here "only very small amounts of fluid could get through the cardia." I do not feel at all sure that they knew where the tube was. It is possible it never went below the cardia, and it is also possible that they never entirely emptied the esophagus. I am wondering about the possibility of prolonged irritation at the lower end with possibly an inflammatory process with erosion and ulceration and an abscess below it, which might be the basis of this epigastric mass. The mass is tender, which is not like many malignant processes, but the patient did not come in with

the clinical signs of abscess formation. In other words, he did not come in with high temperature although he did have a leukocytosis. I think it is more logical to interpret the leukocytosis as going with something that is beginning to form in the right chest that subsequently became pneumonia. I am disturbed that there is nothing in the x-ray films interpreted as a pneumonic process at the right base, nevertheless, I believe he died of a terminal pneumonia. I am sure he had a stricture of the esophagus due to a very benign process. I do not believe it was due to esophageal ulcer, because he does not give a story of ulcer pain. I do not believe he has cancer of the esophagus as an explanation of the entire picture. The recent picture, plus the epigastric mass, I am inclined to explain on the basis of cancer. A malignant tumor in the stomach would be my first guess.

DR. FRANCIS M. RACKEMANN: Do you suppose he could have a rupture at the lower end, with abscess formation?

DR. JONES: I mentioned that as a possibility. Of course if it involved that portion under the diaphragm he could get a localized abscess. I think that is a possibility.

DR. JAMES H. MEANS: Would ventral hernia give a picture like this, with recent cardiospasm at the upper end of the stomach?

DR. AUBREY O. HAMPTON: This picture of the esophagus, the extreme dilatation and this spasm, is quite consistent with cardiospasm. The difficulty of ruling out any other lesion would be great because his esophagus is filled with food and these filling defects cannot be displaced by palpation or any other maneuver except lavage, and it apparently was not done during this examination. He did show this defect in the anterior aspect of the lower end of the esophagus which is present when he is lying down or standing. It does not materially shift or change. It is also strange that this portion of the esophagus is much smaller than the upper portion. I think that the peristaltic activity in the posterior aspect of the esophagus is more than you would expect in the presence of cardiospasm alone, and, furthermore, we do not see the same peristaltic waves in front. I do not see any evidence of perforation of the esophagus or of pneumonia. The diaphragm is perfectly normal in outline and position.

DR. JONES: That was one thing I should have mentioned. If he had a perforation of the esophagus that caused a mass below the xiphoid you should have been able to see barium going through.

DR. HAMPTON: I should think so. I do not believe he had a perforation at the time of this ex-

amination. We cannot reach a definite conclusion about this lesion, but it certainly looks like carcinoma.

DR. WYMAN RICHARDSON: I saw this man in the Out Patient Department and sent him in with a diagnosis of carcinoma of the stomach. I do not know the answer now, but my diagnosis still holds. I disregarded the long history but wondered if he might not have had previously a diaphragmatic hernia of the stomach.

DR. HAMPTON: I have never seen dilatation of the esophagus to that degree due to carcinoma. That is an enormous esophagus.

DR. MEANS: Do you ever see an esophagus of that size due to diaphragmatic hernia?

DR. HAMPTON: No, I do not believe it would become that large, even with an ulcer at the lower end or a benign stricture.

DR. EDWARD B. BENEDICT: I have never seen an esophagus of that size except in cardiospasm.

CLINICAL DIAGNOSES

Cardiospasm with esophageal dilatation
Bronchiectasis

DR. JONES'S DIAGNOSES

Benign esophageal stricture (chronic)
Cancer (probably of stomach)

ANATOMICAL DIAGNOSES

Dilatation and muscular hypertrophy of esophagus (cardiospasm)
Carcinoma of esophagus with metastases
Abscess in subdiaphragmatic metastasis
Acute pneumonitis with abscess formation
Pulmonary tuberculosis, healed, apical
Arteriosclerosis, generalized, moderate.

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY: The autopsy on this man showed, of course, an enormously dilated esophagus with a frank tumor mass at its lower end, chiefly anterior, but to some extent encircling the esophagus and extending down into the stomach for a short distance. There was also a large tumor mass beneath the diaphragm, lying just anterior to the cardia of the stomach and medial to the spleen, this mass consisted of tumor tissue with a large central abscess cavity and a fistula from this cavity into the esophagus. It seemed to be on the point of rupture into the lesser peritoneal cavity but that had not occurred. The tracheal nodes showed metastases and were very much enlarged. It was obvious that the carina was flattened a good deal. There were metastases to the liver, kidneys and a few other lymph nodes. The

least fifteen years, and possibly twice that length of time, symptoms of esophageal obstruction with gradually increasing obstruction and gradual enlargement in the size of the esophagus. Anything that extends over such a period of time by itself cannot be considered a malignant lesion. Therefore, I should say that the symptoms and story were those of a benign obstructing lesion at the lower end of the esophagus. The x-rays show an enormous barium-filled tube that narrowed down in a funnel-shaped manner to the cardiac orifice. There is no mention in the x-ray report in the record that there is anything but a symmetrical or fusiform narrowing of the lower end of the esophagus. The mass that was first noted by x-ray might have been outside the esophagus or connected to it by a small opening. In other words, it might be a huge esophageal diverticulum under the right clavicle, filled with food and fluid, but it seems more reasonable to assume that the whole picture represents a tremendously enlarged esophagus. It is still possible that there was a diverticulum of the upper third, as a matter of fact the upper third is the weakest portion and does dilate readily if back pressure is put against it. So the x-ray findings fit perfectly well with an obstruction at the lower end of the esophagus and explain part of the clinical picture. I cannot conceive of this obstruction's having been due primarily to cancer at the cardiac end of the esophagus. Fifteen years of continuous symptoms without change in character would seem to indicate a benign process which was gradually increasing.

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Final Admission (three months later) For about six weeks after discharge she had only very slight difficulty in swallowing, but she developed a dull, constant, aching sensation across the upper part of her abdomen. She also had a poor appetite but no other symptoms. One month before re-entry she again began to have severe dysphagia with regurgitation of almost all solids and liquids. Finally she was practically unable to take anything by mouth and was given rectal feedings. She had lost about 15 lb in weight during the month before re-entry.

Physical examination revealed a cachectic woman, obviously very ill. Her blood pressure was 85 systolic, 65 diastolic. The examination was otherwise essentially negative.

On the day of entry an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. EARLE M. CHAPMAN: The problem here is obviously the diagnosis of a mass which is causing an infiltrating type of lesion in the lower third of the esophagus, particularly on the right side. The record says, "The tumor mass caused marked narrowing of the lumen so that the barium stream was reduced to a trickle and passed very slowly into the stomach." So we know there is a mass obstructing the esophagus. One interesting point is that she first had difficulty in swallowing solid foods, later liquids. It also says that for two weeks she had a remission and was able to swallow solid foods without difficulty. That to me is rather surprising and I am at a loss to explain it. I do not know why in the course of this disease she should suddenly be free of symptoms. One thinks of unusual lesions, such as a polyp which might lie in the esophagus and move or change in position. I do not see how autodigestion could occur while it was in the esophagus, but if it were on a long pedicle and reached into the stomach, that is possible. One thinks of metastases or some process forming an abscess cavity that drained into the esophagus. There is nothing to indicate that it drained into the pleural space or into the lung. I think these are remote possibilities of what might have explained the remission. The x-rays are the most important part of the whole examination. Perhaps Dr. Hampton will show them.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON: These three films were taken at the first examination, we have an examination nearly three months later and another four months after the second. The total time be-

tween the first and last examinations is seven months. The first examination was before irradiation and shows this filling defect at the lower end of the esophagus with dilatation above, which is quite consistent with carcinoma of the esophagus. Then twenty-seven days later, following irradiation, the esophagus is, so far as I can tell, perfectly normal. I do not believe anyone would suspect that the stomach is abnormal.

DR. CHAPMAN: What do you mean by "thickening of the upper part of the stomach in the posterior wall, but no evidence of tumor"?

DR. HAMPTON: It appears straight and rather rigid at that point, but I should not make a diagnosis of intrinsic disease. But four months later there is definite irregularity of the stomach in the same area that was suspected of being abnormal before, and the irregularity in the lower end of the esophagus is of the same general appearance as before x-ray treatment, except that there is less obstruction. In the upright film taken of the abdomen you can see a gas bubble in the fundus of the stomach, which outlines a definite intrinsic filling defect.

DIFFERENTIAL DIAGNOSIS (continued)

DR. CHAPMAN: What is this tumor mass? We know it is there. What is its character? It is obvious to me that carcinoma was diagnosed clinically. It is characteristic of carcinoma from the x-ray finding, and the story is that of carcinoma. Another fact is that she was treated as if she had carcinoma. She received 11,000 r which is the dose given for carcinoma. It did respond to treatment. It would be interesting to know what the esophagus and the mucous membrane showed following such a massive dose of x-ray. It was wise I suppose that a tube was put down during the treatment, because with that amount of treatment over a tumor area she might have perforated and developed mediastinitis if she were allowed to swallow. The fact that she had a tube in place was a precautionary measure. To me, the facts that she had slight thickening of the upper part of the stomach in the posterior wall, and that this disease started higher up in the esophagus and spread down into the stomach, suggest that the lesion was not a carcinoma. The fact that it does not produce great irritation in the lining of the stomach also points to a different type of lesion. It suggests lymphoblastoma of some sort. What type could it be? Hodgkin's disease is extremely rare in the esophagus. I know of one case, however, because I was fooled on it at a similar conference with third-year students. I said on that occasion "Hodgkin's is one type of lymphoblastoma that I

tumor was a squamous cell carcinoma, obviously primary in the esophagus

I should agree entirely with Dr Jones's discussion, though I cannot prove his contention by any anatomical facts. I do not believe a carcinoma of the stomach can give rise to as large an esophagus as this. I think he must have had some form of benign stricture—almost certainly cardiospasm—for years and that the carcinoma was a relatively late, terminal complication.

There was one other finding, at the right base there was pneumonic consolidation with many abscess cavities within the consolidated area, so that the "pneumonia" without much question was really an inhalation pneumonitis from regurgitation and aspiration of material from the esophagus. That is not an uncommon complication in esophageal stricture.

DR. HAMPTON His chest plates ought to have shown bronchopneumonia at both bases, but they are strangely clear.

DR. JONES What is the usual spread of carcinoma of the esophagus below the diaphragm?

DR. MALLORY A fair number will extend across the sphincter and actually invade the stomach for a short distance. The most common spread is to the regional nodes and frequently there is direct extension to the pleura and lungs.

DR. RACKEMANN Did the tumor extend upward far enough to account for the defect in the wall of the esophagus?

DR. MALLORY Yes.

DR. RICHARDSON Is there not a definite inflammation of the esophageal wall in cardiospasm?

DR. MALLORY One can say that the esophageal wall above the tumor is quite hypertrophied in spite of the dilatation. It still is much thicker than a normal esophagus, which would prove anatomically that the obstruction was of long duration, at any rate much longer than the few months of the terminal part of the history. So far as any other specific lesion of cardiospasm is concerned, I am not convinced there is one.

DR. JONES In the ones you have examined do you not find a narrow cardiac orifice with fibrosis?

DR. MALLORY There is always some fibrosis; anyone who has retained food in the esophagus for twenty years should have a little inflammatory reaction to it.

CASE 24142

PRESENTATION OF CASE

First Admission A fifty-five-year-old housewife entered the hospital with the complaint of difficulty in swallowing.

She felt perfectly well until seven months before entry, when she began to have pain in her epigastrium brought on by swallowing solid food. As soon as the food passed a certain point in her esophagus the pain ceased. She was perfectly comfortable when not swallowing. These symptoms continued and became slightly more troublesome until four months before entry, when for a period of two weeks she had a remission and was able to swallow solid foods without difficulty. However, her symptoms returned and for the two months before entry she was able to eat only semi-solid foods and liquids. During the week before entry she even began to have difficulty in swallowing liquids. During her illness she lost at least 20 lb in weight. She had had no nausea, vomiting, hematemesis or melena. Her past history and family history were noncontributory.

Physical examination revealed a well-developed, somewhat emaciated white woman, in no apparent discomfort. Except for emaciation and dental caries, the physical examination was entirely negative. The blood pressure was 106 systolic, 76 diastolic.

The temperature was 98.6°F., the pulse 95. The respirations were 20.

The urine examination was negative. The blood showed a hemoglobin of 75 per cent and a white cell count of 7100 with 66 per cent polymorphonuclears. The blood Hinton test was negative.

An x-ray examination of the esophagus showed a tumor mass infiltrating the right side of the esophagus in its lower third. The tumor caused marked narrowing of the lumen so that the barium stream was reduced to a trickle and passed very slowly into the stomach. The esophagus above the lesion was dilated and showed marked peristalsis. The stomach was normal.

She stayed in the hospital for three months and was given daily x-ray treatments amounting to 11,600 r units. The radiation was given in doses of 200 r through four portals. She was fed by nasal tube for the first two months and was fairly comfortable except for occasional nausea and rare episodes of vomiting. On one occasion she vomited about 100 cc of thin red fluid. After the first two months the tube was removed, and she began taking fluids and soft solids with little difficulty and no pain. Three weeks later an x-ray examination of the esophagus showed no definite lesion. She continued to improve and gain weight, and a week before discharge a repeat x-ray examination again showed an apparently normal esophagus. There was slight thickening of the upper part of the stomach in the posterior wall, but there was no evidence of tumor.

SECTION TWO*

EDITORIAL

THE COMMISSIONER
OF PUBLIC HEALTH

THE functions of the Massachusetts Department of Public Health are many. Its Division of Communicable Diseases, through the district health officers, assists local boards of health in the control of disease, and offers diagnostic aid through the Bacteriological Laboratory at the State House. Its Division of Biological Laboratories manufactures and supplies various biological products for the treatment of disease, and gives diagnostic aid through the Wassermann Laboratory. Its Division of Food and Drugs protects the people of the Commonwealth against the adulteration of food and drugs. Its Division of Tuberculosis is in charge of the state sanatoriums that care for the tuberculous and those with cancer and the sequelae of infantile paralysis, in addition to conducting the tuberculosis-control program and the follow-up work in connection with the Chadwick Clinics. Its Division of Child Hygiene is concerned with all aspects of child health. Its Division of Adult Hygiene conducts investigative and educational work in regard to cancer, diabetes and arthritis. The work of its Division of Genitoinfectious Diseases is largely educational, but this division also subsidizes a number of municipal clinics for the treatment of gonorrhea and syphilis. Its Division of Sanitary Engineering has oversight of water supplies, sewage-disposal systems and the shell-fish industry, certain special engineering projects are carried through each year, and the division conducts an Experiment Station, which has made many important contributions to our knowledge of sanitary engineering. Its Division of Administration, in addition to supervising

the activities of all other divisions and to directing general public-health problems, has charge of the crippled-children's clinics which are financed through grants from the United States Public Health Service and the Children's Bureau.

During 1937 over \$3,200,000 was required to finance all these activities, in addition to federal grants under the Social Security Act of approximately \$400,000. The department employs nearly 1500 individuals, and during the past year furnished 387,000 days of state-sanatorium care to 1900 patients, in addition to that required by 1437 persons admitted to the Pondville Hospital.

The responsibility of directing this huge undertaking rests upon the Commissioner of Public Health, and the people, particularly the physicians, of the Commonwealth have every right to demand that he be experienced and of proved ability, as specified by existing statutes†. Beliefs, political or otherwise, should not influence his selection: the health of the people is far too important to be jeopardized by such considerations, as has been amply demonstrated by the unfortunate series of events in the Department of Mental Diseases during the past two years.

If the excellence of and the notable contributions to public-health administration that have characterized the activities of the Massachusetts Department of Public Health for nearly seventy years are to continue, this department must be under the guidance of one who has had special training and experience in public-health work. The Council of the Massachusetts Medical Society at its stated meeting on February 2 passed a resolution approving of Dr. Henry D. Chadwick's reappointment. *It becomes the duty of all members of the Society to make every possible effort to effect his continuance in office!*

This issue of the New England Journal of Medicine is published in two volumes.

*General Laws: Tercentenary Edition, Chapter 17, Section 2.

have never seen involving the esophagus" But that is what it was

What other type could this be? Perhaps the diffuse, spreading type of lymphosarcoma. We also see diffuse spread of the reticulum-cell and stem-cell types. We know that she responded to x-ray, but the response is no proof of the diagnosis. If this were any form of lymphoblastoma she probably would have responded to a much smaller dose of x-ray. On the other hand the fact that she shows this picture is very suggestive of lymphoblastoma.

As to the final episode when she returned, examination was again negative. I am surprised that physical examination did not show some enlargement of nodes in the neck, groin or retroperitoneal region, or possibly a palpable or enlarged spleen. Her blood pressure had fallen, but I believe we need not think of a cardiovascular accident, such as coronary occlusion. I should think that lymphoblastoma is a good working diagnosis, and it is the best I can offer.

CLINICAL DIAGNOSIS

Lymphoblastoma of the esophagus

DR. CHAPMAN'S DIAGNOSIS

Lymphoblastoma of the esophagus and stomach, probably lymphosarcoma

ANATOMICAL DIAGNOSES

Carcinoma of esophagus with extension to stomach and metastases
Esophagopericardial fistula
Pericarditis, acute fibrinopurulent
Empyema, right.
Pulmonary infarct.
Operative wound gastrostomy
Cholecystitis, chronic
Cholelithiasis

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY With any tumor in this area I think it is impossible to distinguish clinically whether it starts in the stomach or esophagus. X-ray examination may be misleading, and sometimes it is even impossible at autopsy. Histologic examination usually settles the issue, but once in a while it is difficult even when all the facts are in. I think I should explain why such a massive dose of x-ray treatment was given to this patient. A biopsy was done and on a section which was sent to us from another laboratory we found obviously malignant tumor cells, predominantly spindle-shaped, and we made a diagnosis of leiomyosarcoma. That is not a radiosensitive tumor, and our report undoubtedly influenced the x-ray department to use the maximum dose. They were then quite astonished to see the disease melt away. If it really had been a leiomyosarcoma even after such a dose it probably would not have been affected. The tumor, as you have seen, recurred fairly promptly, and at the time of autopsy we found a large tumor involving both the lower end of the esophagus and the cardia of the stomach. There was ulcerated tumor extending 4 cm above the cardia, and a fungating mass which extended down into the stomach for 6 or 7 cm. The tumor had grown through the posterior wall of the stomach and was invading the pancreas. There was a perforation through the esophageal portion of the tumor into the pericardium, with a terminal pericarditis. There was also an empyema. We could not discover any fistulous tract connecting the esophagus and the empyema. On microscopic examination it was quite evident that it was an epidermoid carcinoma which must have been primary in the esophagus. It was of a very high grade of malignancy. These very undifferentiated epidermoids are fairly sensitive to radiation, and the temporary response is therefore not surprising.

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THE NEW HAMPSHIRE MEDICAL SOCIETY
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U.S.P. UNITS FOR LIVER EXTRACT

With the preparation of the first extracts of liver for use in pernicious anemia it became apparent that variable losses of potent material occurred, depending on the method of manufacture. Nevertheless, until quite recently, in describing such products reference has usually been made to the amount of liver used in their preparation rather than to the potency of the final product.

The first step toward a better definition was taken a few years ago by the Council on Pharmacy and Chemistry of the American Medical Association, which established for acceptable products certain minimal requirements in terms of hematopoietic power when given in reasonable dosage. With the eleventh revision of the *Pharmacopoeia of the United States*, the determination of the potency of preparations of liver or stomach was referred to the Anti-anemia Preparations Advisory Board. To this board, various manufacturers have

submitted data as to the clinical effectiveness of certain preparations of liver administered in a specified manner, and from these data the board has assigned a unitage to each product. Elsewhere in this issue will be found a definition of the meaning of these units, whether for "oral" or for "injectable" products, together with a list of values in terms of units for each preparation at present accepted.

It is to be emphasized that, although a unit of material prepared by different manufacturers may be expected to produce similar hematopoietic effects in pernicious anemia, it is not known that units of all preparations will have similar effects on gastrointestinal and neural manifestations. There is some evidence to suggest that even the hematopoietic effect of preparations of liver depends on multiple factors rather than a single chemical entity, and it is possible that with different manufacturing processes variable amounts of substances with a particular effectiveness, respectively, on the gastrointestinal and the neural manifestations of pernicious anemia have been retained. Such differences are perhaps especially likely to appear in the treatment of atypical patients or in related conditions such as sprue or the pernicious anemia of pregnancy.

The number of products accepted by the board means that no physician need use products not so listed. Although certain eminently satisfactory products do not appear in the present list, the board expects to assign unitage to new products which may be submitted, it will also re-evaluate products according to new clinical data. By comparison of the unitage, the relative concentration and the bulk of these products, the physician should be able to select the preparation most suitable for his purpose. With a knowledge of the price of the various preparations he should be able to estimate the comparative cost per unit of potency of different preparations. At any rate, an important step in the right direction has been taken in that the medical profession now has available a better knowledge of the potency residing in the final product, irrespective of how much effective material may have been lost or discarded in the manufacturing process.

noted on admission was treated with ferrous sulfate, 12 gr. daily

On February 12 x-ray examination showed the occipitofrontal diameter of the baby to be 11.3 cm., predicting an infant of minimum weight of 5 lb. On February 14 under gas-oxygen anesthesia and with all aseptic precautions, a vaginal examination was done which revealed the os to be easily patulous to one finger, the placental margin was felt 4 cm. within the internal os on the anterior surface of the lower uterine segment. An immediate abdominal cesarean section of the classical type was done with delivery of a 6 lb., 4 oz., female child in good condition. Both patient and baby made an uncomplicated recovery and left the hospital on March 3 in good condition, the baby weighing 6 lb., 6 oz.

Comment Vaginal bleeding, no matter how slight in amount, in the early part of the last trimester of pregnancy must always be looked upon as potentially serious, as was done in this case. At this time, of course, the baby's viability is extremely doubtful no matter what method of delivery is contemplated. Hospitalization is imperative. Slight bleeding may be the precursor of extreme bleeding. A vaginal examination when the bleeding ceases to determine the exact cause of the bleeding is unwise because of the possibility of starting up a hemorrhage which will make delivery imperative to save the mother's life, and there is then practically no chance of a live baby. The use of x-ray measurements to determine the degree of prematurity is well worth while. In this case it gave results which definitely influenced the time of operation. It must be borne in mind, however, that it is not an infallible procedure as its results are not uniformly accurate. It may well have been, in spite of the successful outcome of this case, that another week or ten days before a final examination was undertaken would have assured a baby whose chance of survival would have been more enhanced by the extra period of intrauterine life, but it may be argued that if operation had been delayed ten days, a serious hemorrhage might have occurred. When any such case is examined, everything must be ready. There is no mention in this case of having a compatible donor at hand. This constitutes added safety for the mother and is a routine procedure which often saves life.

In the treatment of marginal placenta previa a bag is sometimes used, and sometimes the membranes are ruptured. Rupture of the membranes is rarely successful unless the patient is in labor. The use of a bag through an undilated cervix in a patient who is not in labor and is not bleeding is not so safe for the baby as an abdominal section. It carries with it the risk to the mother of added

bleeding which the abdominal operation does not entail

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning April 11

BARNSTABLE

The session scheduled for Easter Sunday, April 17, has been postponed to Sunday, May 1. John I. B. Vail, *Chairman*

BERKSHIRE

Thursday, April 14, at 4:30 p. m., at the House of Mercy Hospital, Pittsfield. Subject: Early Syphilis. Instructor: Francis M. Thurmon. Melvin H. Walker, Jr., *Chairman*

BRISTOL SOUTH (Fall River Section)

Monday, April 11, at 4:30 p. m., at the Union Hospital, Fall River. Subject: Cesarean Section, Analgesia. Instructor: M. Fletcher Eades. Howard P. Sawyer and Robert H. Goodwin, *Chairmen*

ESSEX NORTH

Friday, April 15, at 4:30 p. m., at the Lawrence General Hospital, Lawrence. Subject: Cesarean Section, Analgesia. Instructor: M. Fletcher Eades. John Parr, *Chairman*

FRANKLIN

Wednesday, April 13, at 8:00 p. m., at the Franklin County Hospital, Greenfield. Subject: Pneumococcus Pneumonia and Serum Therapy. Instructor: Frederick T. Lord. Halbert G. Stetson, *Chairman*

HAMPDEN

Thursday, April 14, at 4:00 p. m., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8:00 p. m., in the Out-patient Department of the Skinner Clinic, Holyoke Hospital, Holyoke. Subject: Some Complications of Labor Analgesics in Labor. Instructor: Raymond S. Titus. George D. Henderson and George L. Schadt, *Chairmen*

HAMPSHIRE

Wednesday, April 13, at 4:15 p. m., in the Nurses Home, Cooley Dickinson Hospital, Northampton. Subject: Recent Advances in the Diagnosis and Treatment of Heart Disease. Instructor: Burton E. Hamilton. Warren P. Cordes, *Chairman*

MIDDLESEX SOUTH

Wednesday, April 13, at 4:00 p. m., at the Cambridge Municipal Hospital, Cambridge Street, Cambridge. Subject: The Use of Vitamins in Pediatric Practice. Instructor: Louis K. Diamond. Edmund H. Robbins, *Chairman*

NORFOLK

Friday, April 15, at 8:30 p. m., at the Norwood Hospital, Norwood. Subject: Acute Anterior Poliomyelitis—Its Diagnosis and Treatment. Instructor: Charles F. McKhann, Jr. Hugo B. C. Riemer, *Chairman*

JOURNAL OF NEUROPHYSIOLOGY

A NEW medical journal, reflecting the rapid advance in our knowledge of the physiology of the nervous system, named the *Journal of Neurophysiology*, was issued for the first time in January, 1938. This journal has distinct aims, somewhat different from those of almost any other publication. In the first place, it plans to provide a channel for the prompt publication of original work, embracing all aspects of the subject amenable to experimental analysis. The journal will be published six times a year and an editorial board of three has been organized to reach prompt decisions on all contributions submitted. Papers to be published will be selected four weeks prior to their appearance, and it is hoped by this means that papers will actually appear in their printed form within two months or less after their receipt by the editors. Thus, along with a careful editorial policy in regard to literary form, should make this journal unique among medical publications. The members of the editorial board—J. G. Dusser de Barenne, J. F. Fulton and R. W. Gerard—are sufficiently well known in the field of neurology and physiology to justify the expectation that this journal will not only have a wide field of usefulness, but that the editors will uphold the strict rules which they have laid down. The *New England Journal of Medicine* extends its best wishes to this new journal of so much promise.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No. 66 MARGINAL PLACENTA PREVIA

Mrs. M. B., aged thirty years, was seen at home on January 23, 1936, in the thirty-first week of her fourth pregnancy. Shortly before the visit she had passed some blood by vagina, "just like the be-

ginning of a period." There was no pain or cramps.

Her family history was negative. Her past history included measles, mumps, chickenpox and pertussis in childhood and influenza at thirteen. Her tonsils had been removed at the age of four, and she had injured her right kidney in a coasting accident at sixteen without, however, any serious sequelae. Her catamenia, which began at twelve or thirteen, were of the twenty-six to twenty-eight day type and lasted five or six days without pain. Her last period was June 25, making the expected date of labor April 1 to April 4. Mrs. B. had given birth to one child, who was now ten years of age. Her second and third pregnancies had been interrupted by induced abortions in 1928. The present pregnancy had been normal to date, and she had had no previous medical supervision.

Physical examination showed a well-developed and nourished woman, lying comfortably in bed and in excellent general condition. Her temperature was 98°F, pulse 80, respirations 20, and her blood pressure was 122 systolic, 74 diastolic. Her color was good, her eyes, nose, throat and neck were negative, and her teeth were well cared for. The breasts showed the usual signs of pregnancy. The heart showed no enlargement, there were no murmurs. The lungs were normal, there were no rales. The uterus corresponded in size to a seven months' pregnancy and was neither tender, spastic nor in labor. The fetus was presenting in LOA position, with the vertex unengaged, the fetal heart rate was 156. A vulvar pad worn by the patient showed a small amount of dark blood, and the total estimated quantity of blood lost did not exceed half an ounce.

The patient was at once transported by ambulance to the hospital, where further studies showed a urine negative for albumin and sugar, a hemoglobin of 70 per cent (Sahli), a red-blood-cell count 3,820,000 and a normal blood smear. X-rays taken for measurement of the fetal head by stereoradiography showed the occipitofrontal diameter to be 10.3 cm.

A policy of watchful waiting was pursued because, first, the bleeding had been slight in amount and insufficient to jeopardize in itself the life of the patient or her baby, secondly, the latter was a dubious risk for immediate delivery by any method, and thirdly, the patient agreed to remain in the hospital until viability of the infant could be assured provided no further bleeding occurred. A very small amount of brown staining occurred on January 24 and January 30, while her general condition, blood pressure and urine remained normal. The slight degree of hypochromic anemia

A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

this request is a larger issue than the mere righting of a single wrong. It is the feeling in our minds that the *Journal* should maintain the same unprejudiced attitude toward the social and economic problems of medicine and public health that it holds toward clinical problems, providing an open forum with room for minority opinion and welcoming any new ideas which are honestly and intelligently presented. Furthermore, in our opinion the *Journal* should seek to stimulate similar free and open discussion among local medical societies and in local medical journals. We believe that if such an attitude is encouraged by the Board of Trustees, these Principles and Proposals will receive unprejudiced consideration before and at the 1938 meeting of the American Medical Association in California.

We are sure that your board will agree that if any argument or controversy arises it should be conducted in a dignified manner, on the usual plane of scientific disagreement by presentation of observation and inference, without recourse to irrelevant personalities and unsupported by the weapons of ridicule and innuendo which, we protest, have characterized certain editorials of our *Journal*.

We ask

1. Publication in the *Journal* of our communication of December 8
2. An agreement to open the pages of the *Journal* to reasonable and honest discussion of social and economic problems concerning the provision of medical care.
3. That all discussion of these problems be kept on a plane consonant with the dignity of the profession of medicine.
4. That you give us a prompt answer so that we may determine our future course.

After discussion that lasted until 3 p. m. the Board of Trustees passed the following votes

1. That the statement submitted by the committee under date of December 8 for publication in the *Journal* be suitably edited, as are all communications offered for publication in that periodical, and that it be then submitted to the Committee of Physicians for approval.
2. That there be more discussion in the *Journal* of social and economic problems concerning the provision of medical care with the presentation of various aspects of the subject.

By agreement no notice of the purposes or results of the meeting were given to the press, except the statement that an amicable solution of the differences between the two parties might be expected.

On February 26 the committee convened in New York City to consider the results of the Chicago meeting. Before this there had been received from Dr. Morris Fishbein an edited version of the committee's statement together with an editorial comment. These were taken the same evening, with the criticisms of the committee, by Drs. Weiss and Peters to Dr. Fishbein, who was staying in New York. With one exception the suggestions of the committee were accepted. Both the editorial comment and the statement of attitude and intent were thereupon forwarded to the *Journal* for publication March 12 with the understanding that no additional remarks would be printed at this time.

This objective having been attained it has become nec-

essary to consider the further course of action of the committee and the signators.

The animosities first aroused by the public appearance of the Principles and Proposals are giving way to more mature consideration. There can be no doubt that the Principles and Proposals have aroused healthy discussion of the subject with which they are concerned.

Although the Principles and Proposals have no absolute value and should not be considered unalterable, they constitute the instrument which has united and stimulated a large group of physicians. The very general form of their statements allows latitude of interpretation without degradation of spirit and makes them a large common denominator of liberal medical opinion. For the present, then, they may well be retained entire as a tentative platform.

It is clearly recognized that the self-appointed committee should eventually give way to some more representative body appointed by democratic methods. Already, in the interests of more equitable representation, the committee has been enlarged. It now consists of the following men:

Dr. Russell L. Cecil (chairman), Dr. Hugh Cabot (vice-chairman), Dr. Milton C. Winternitz (vice-chairman), Dr. John P. Peters (secretary), Dr. George Blumer, Dr. Allan M. Butler, Dr. Louis Casamajor, Dr. Thomas B. Cooley, Dr. J. Rosslyn Earp, Dr. Channing Frothingham, Dr. L. Emmett Holt, Dr. William S. Ladd, Dr. William S. McCann, Dr. George R. Minot, Dr. Hugh Morgan, Dr. Robert B. Osgood, Dr. Richard M. Smith, Dr. John H. Stokes, Dr. Borden S. Veeder, Dr. James J. Waring, Dr. Soma Weiss.

The committee is receptive to suggestions for reorganization along representative democratic lines. Suggestions from individual signators or groups of signators for a future program will also be welcomed.

The committee has felt from the outset that the Principles and Proposals were composed by and for physicians. Although they have received the approval of great numbers of laymen and of lay organizations devoted to medical, social and economic projects, the committee has merely acknowledged this approbation. It has sedulously refused all offers of support from lay sources. It has even refrained from participation in public programs fostered or sponsored by lay groups. All its activities since November 7 have been financed by voluntary contributions from members of the committee and a small number of signators.

INTERNATIONAL BROADCAST ON RHEUMATIC HEART DISEASE

Leading British and American physicians, 6000 miles apart, will confer via the radio on the greatest menace to child health, rheumatic heart disease. This conference, the first international broadcast on any health problem, will be heard over the Red Network of the National Broadcasting Company on Monday evening, May 2, at seven-thirty o'clock Eastern D.S.T. Arranged by the American Heart Association, the conference broadcast will observe National Child Health Day.

Lord Thomas Jeeves Horder, physician-in-ordinary to the King of England, will open the conference speaking from London. Dr. Homer F. Swift, of the Rockefeller Institute, New York City, and Dr. T. Duckett Jones, of the House of the Good Samaritan, Boston, will then speak from Atlantic City where they will be attending the

DEATH

TURNER—RALPH GORDON TURNER, M.D., of 1565 Main Street, Walpole, died at his home, March 26. He was in his thirty-second year.

Born in Marlboro, he was graduated from Dartmouth College in 1928 and received his degree from Rush Medical College, University of Chicago, in 1933.

Dr. Turner was a member of the American Medical Association, a fellow of the Massachusetts Medical Society and held memberships in the Phi Sigma Kappa and Alpha Kappa Kappa fraternities.

His widow, two brothers and his parents survive him.

MISCELLANY

COMMITTEE OF PHYSICIANS

Following the numerous discussions of the Principles and Proposals by medical societies throughout New England many physicians will doubtless be interested in an abbreviated form of the statement sent by the Committee of Physicians to the endorers on March 2.

* * *

As a result of the editorial of October 16 in the *Journal of the American Medical Association* the Principles and Proposals with the list of signators were treated on November 7 to unfortunate publicity in the lay press, despite the best efforts of the committee. Especially unhappy was the general impression that the proponents of the Principles and Proposals were revolting against the American Medical Association. Although this impression arose directly from the *Journal of the American Medical Association* editorial, which had been released to the press before publication, the onus for the publicity fell largely on the committee. The immediate consequence was the withdrawal of a certain number of signatures and a sudden retardation in the growth of the list of endorers. In addition to those who withdrew unconditionally a large number asked that their names be not used until they received further information concerning the past course and future intentions of the committee. (It is appropriate to state that very few of those who withdrew claimed that they were unaware of the nature or purpose of the Principles and Proposals.)

The *Journal of the American Medical Association* editorial had so misinterpreted the actions and intentions of the committee and the signators that it became at once apparent that the true issues raised by the Principles and Proposals were being obscured by discussion of irrelevancies. At this time the most important immediate objectives in the opinion of the committee were to obtain a hearing before the Board of Trustees of the American Medical Association and to secure the right to state its position in the *Journal of the American Medical Association* thus correcting the false impressions created by the editorial of October 16. Although a second editorial published on November 27 purported to have the sanction of the trustees, the committee had received no formal intimation that this body had taken any action with respect to the Principles and Proposals or their sponsors. They therefore on November 20 requested a hearing before this body and on December 8 asked the trustees to authorize publication in the *Journal of the American Medical Association* of a statement explaining the attitude and intent of the committee. At its meeting in December, the Board of Trustees of the American Medical Association invited the committee to send representatives to the meeting of the trustees in Chicago, February 17. Consideration of the publication of the committee's state-

ment was postponed until the same date and all efforts of the committee to secure earlier action were fruitless.

On February 17 at 11 a. m. a delegation from the committee, consisting of Dr. Hugh Cabot, chairman, Drs. Cooley, Holt, Morgan, Osgood, Peters and Veeder, appeared before the Board of Trustees and presented the following statement:

We appear before the Board of Trustees as delegates of a self-appointed committee, who represent the feelings of a considerable group of members of the American Medical Association. Interest in this common cause has in no sense altered the allegiance of this group to the American Medical Association. We therefore welcome the opportunity to appear before its governing body. The subject which we wish to discuss with you, first, is the purpose of the Principles and Proposals, which, we believe, have been both misunderstood and misinterpreted. Although these arose under the stimulus of the American Foundation's report, *American Medicine*, they were not derived from this report, nor did they emanate from the American Foundation or from any source other than the minds of certain members of this committee. After deliberation a consensus was achieved. It represents the greatest common denominator of these personal opinions concerning the directions which the policies of the organized medical profession of the United States should take in order to advance the quality of medical care. Its purpose was also to forestall untimely and unwelcome lay and governmental interference by demonstrating the openmindedness and declaring the good will of the medical profession and its desire to assert its prerogative as an expert body to lead all movements to improve medical care. It was hoped that the draft might create healthy discussion, and progressive action throughout the country if it were presented to the American Medical Association and its component societies. This feeling was strengthened by the reports of the reference committee to the House of Delegates at Atlantic City in 1937 concerning a slightly modified draft presented by the New York State delegation.

Unfortunately, an editorial appeared in the *Journal of the American Medical Association* of October 16, condemning the Principles and Proposals and intimating that their authors and endorers were acting in contravention of the policies of the American Medical Association and of the best interests of American medicine. This editorial and others which followed have, we believe, put an unfortunate color upon the publicity which the Principles and Proposals have received, they have beclouded the true issues with irrelevancies and have militated against the unprejudiced consideration of a subject which is as dear to the American Medical Association as to ourselves, namely the advancement of measures for the improvement of medical care.

We therefore submitted for publication in the *Journal* of our association a statement of our attitude and intent, to correct what we consider to be erroneous impressions that have arisen from these editorials. This statement was presented to this board on December 8, 1937, two months ago. We believe that the democratic organization of the American Medical Association and the editorial integrity of the *Journal* justify us in asking this board to expedite its publication, which has already been long delayed. Belund

incorporated as a nonprofit organization. The Aetna Life Insurance Company is offering a plan for hospitalization insurance, very similar to that established by the Plan for Hospital Care. Under both, insurance is limited to groups employed in stores, factories, offices and in industries. Groups of 10 persons employed by the same firm, and their families, are insurable under the Plan for Hospital Care. The Aetna plan has been launched among concerns that now carry group life insurance policies with the company, and requires signatures of 75 per cent of the employees covered by the group life policy. Only actual employees are covered, but it is said that the service will soon be extended to include the members of their families.

The Aetna plan provides benefits of \$400 a day at monthly cost to the insured of 77 cents. Coverage is for seventy days during any one disability, except that if the disability is due to pregnancy the benefits are for a maximum of fourteen days. In addition to the benefit, the employee, under the Aetna plan, is entitled to reimbursement for any fees actually charged for anesthetics or their administration, for the use of operating room and for laboratory fees, excluding x ray fees, up to a maximum, during any one disability, of five times the daily benefit. Employees under seventy years of age are eligible and may be insured until that age is reached.

The Plan for Hospital Care limits the benefits to twenty one days in any one year, and covers a bed in semi-private accommodations, meals, general nursing care, operating room service, all medications, all surgical dressings, routine laboratory services, oxygen and serums, basal metabolism tests, ambulance service within three miles radius of the member hospital, maternity delivery room service (one year after subscriber joins plan) and ordinary nursery care of newborn baby. If any subscriber takes a private room, he is allowed \$4.50 a day credit on its cost. If he is taken to a non-member hospital, he receives a cash credit of \$600 a day against his bill. For 50 cents a month additional, the wife or husband of a subscriber is covered, and for 25 cents a month all children that have not reached their nineteenth birthday are included. Dependents of subscribers, however, are required to pay the hospitals \$100 a day to get the same benefits that are payable to subscribers. The Plan for Hospital Care does not accept persons who have reached their sixtieth birthday, but once one is enrolled one may continue indefinitely. The Plan for Hospital Care does not include the cost of anesthesia, physiotherapy, x-ray and electrocardiography.

Neither plan makes any provision for the payment of physicians and surgeons fees. Neither plan permits an individual to join independently of the groups in which he is employed, and in both plans the premiums are paid by the employers, who are authorized by the insured to deduct them from their pay each month.

DOCTORS ALONE ELIGIBLE FOR HEALTH POSTS

Every town, city and borough in Connecticut must have a health officer who is a licensed practitioner of medicine according to an opinion handed down by the Deputy Attorney. The law does not require, however, that the health officer be a resident of the town or city where he officiates.

RESULTS OF PREMARITAL BLOOD TEST

From data available for 1937 there were considerably more cases of syphilis uncovered as a result of the premarital blood test than in 1936. Syphilis occurred about

equally in men and women. From the standpoint of prevention of congenital syphilis the tests on women are most important.

INSPECTION OF INDOOR WATER POLLUTION

The first local survey of water supplies of buildings was started in Hartford in 1937. Since then surveys have been started in New Haven, Bridgeport, New Britain and Waterbury. In the Hartford inspection from March through December, ninety six buildings were included. Inadequately protected drinking water tanks were found, and several direct connections to sewers from water lines through refrigeration and air-conditioning equipment were discovered. In all cases building owners and managers have been willing and even anxious to make any desired improvements after the hazards have been explained.

HEALTH-OFFICER APPOINTMENTS

Ernest R. Pendleton, M.D., has been appointed health officer of Granby replacing Mr. Wesley N. Clark, resigned.

Eugene N. Cozzolino, M.D., has been appointed health officer of West Haven to fill the vacancy caused by the death of Charles E. Kaufman, M.D.

H. R. Hansell, M.D., has been appointed health officer of Sharon during the absence of Jerome S. Chaffee, M.D.

John E. Stoddard, M.D., has been appointed health officer of Meriden to succeed Michael J. Sullivan, M.D.

Winfield E. Wight, M.D., has been appointed health officer of Thomaston to replace J. H. Kane, M.D., resigned.

DEATHS

O'CONNELL—THOMAS S. O'CONNELL, M.D., seventy-one, of 59 Burnside Avenue, East Hartford, for nearly half a century a practicing physician in that town and its representative in the last session of the General Assembly, died at St. Francis Hospital, February 25, after a long illness.

For forty years a member of the East Hartford School Board, Dr. O'Connell had long been an outstanding member of the High School Committee besides serving as school physician. He was also an East Hartford fire-district commissioner, and served several terms as Democratic town chairman. He was examining physician for several insurance companies and for many lodges.

Born in Colchester, December 15, 1866, he was educated in the public schools and at Bacon Academy. He began to teach school when he was nineteen years old, and four years later entered the Baltimore College of Physicians and Surgeons. He was graduated near the top of his class in 1892. His practice in East Hartford opened in August, 1892, was continued until his final illness.

He leaves a son, Judge Richard D. O'Connell, of the East Hartford Town Court, a daughter, Mrs. Frederick Welsh, of Irvington, New Jersey, two brothers, Judge Michael D. O'Connell, of Stafford Springs, and John O'Connell, of Lynn, Massachusetts, two sisters, Miss Margaret O'Connell, who lived with him in East Hartford and Miss Anne O'Connell, of Colchester, and two grand children.

PRATT—EDWARD LOOMIS PRATT, M.D., seventy-nine, a leading physician in Winsted for fifty-three years and one of the founders of the Litchfield County Hospital, died March 4.

Dr. Pratt was born November 2, 1858, in Ravenna, Ohio, the son of Dr. Henry Pratt and Anna (Barnes)

annual meeting of the American Society for Clinical Investigation Dr William J Kerr, president of the American Heart Association, will take up the discussion from San Francisco

Rheumatic heart disease is now recognized as the deadliest and most crippling affliction of children of school age. Its annual mortality rate is seven times that of dread infantile paralysis during an epidemic, while every year it invisibly cripples thousands more. Close to a million persons in the United States have hearts damaged by rheumatic fever.

Lord Horder's discussion will dwell upon public-health aspects of the disease, particularly in England. The radio audience will then be carried to Atlantic City to hear Dr Swift describe the medical investigations being carried on to isolate the cause of the disease. Dr Jones will follow with a discussion of the treatment of children with crippled hearts, emphasizing the need for long-continued sanatorial care. Dr Kerr, from the West Coast, will tell of the work of the American Heart Association in this field.

This international conference broadcast was conceived by a committee of Irvington House, sanatorium for the care of children with heart disease at Irvington-on-Hudson, New York, in an effort to stimulate greater public interest and action in this major child health problem. It will acquaint doctors, and particularly parents and teachers, with the challenge of rheumatic heart disease, more dangerous because of the lack of knowledge of its nature and the difficulty in recognizing its early symptoms. Although no effective cure has yet been found, it is hoped that this broadcast will be a first step in the earlier recognition of the disease which, if unchecked, finally incapacitates the heart. A widespread realization of its prevalence should encourage increased support of scientific studies along these lines.

The present difficulty in arousing the attention of the public to rheumatic heart disease lies partly in its undramatic nature. Compared with the explosiveness and rapid pace of most childhood diseases, it plays the triumphant but unspectacular role of the tortoise in the fable of the tortoise and the hare. It is not easy, without specific education, to recognize the first slow manifestations of rheumatic heart disease as the onset of a systemic disease which may forever cripple the heart of a child.

CONNECTICUT NEWS

NEW HEAD OF NEW HAVEN HOSPITAL

The Board of Directors of the New Haven Hospital has announced the appointment of James A. Hamilton, of Cleveland, Ohio, as superintendent of the hospital to succeed Dr Albert W. Buck, who assumed the superintendency of the Charlotte Hungerford Hospital in Torrington on January 1.

Mr Hamilton was graduated from Dartmouth College in 1922 and obtained his master's degree in 1923 from the Amos Tuck School of Business Administration. He was assistant professor of industrial management at Dartmouth from 1923 to 1936 and for ten years superintendent of the Mary Hitchcock Memorial Hospital at Hanover, New Hampshire. He is at the present time superintendent of the Cleveland City Hospital and lecturer at Western Reserve University. Mr Hamilton plans to take up his work on September 1 after a summer vacation in California.

DR. MACCARTY OF MAYO FOUNDATION SPEAKS

Dr William Carpenter MacCarty, professor of pathology at the Mayo Foundation at Rochester, Minnesota,

and one of the nation's foremost authorities on cancer, was one of the speakers at the first of the 1938 meetings of the Association of Connecticut Tumor Clinics held at St. Francis Hospital on February 24. About 100 persons, among them representatives from hospitals throughout the State, attended the meeting over which Dr L. P. Hastings, chairman of the tumor group, presided. Papers and clinical cases were presented by the members of St. Francis staff, including Drs Edward J. Whalen, Richard C. Buckley and Andrew F. Resnisky. Following the medical education meeting, those attending were entertained at a dinner as guests of the hospital.

DR. CARL WAGNER OPENS SANATORIUM

Dr Carl P. Wagner, former senior psychiatrist at the Hartford Neuro-Psychiatric Institute of the Hartford Retreat, has opened a new private sanatorium for the treatment of a limited number of convalescent, nervous and mild mental patients on the former Alfred Gildersleeve estate on Marlborough Street, Portland.

The institution, called Elmcrest Manor, is on the crest of a hill overlooking the Connecticut Valley. It is housed in a large white mansion, built in 1815, set almost in the center of eight acres of grounds and surrounded by tall, old elm trees and formal gardens. There are separate three-bed wards for men and women patients, semi-private rooms and private rooms.

Dr Wagner, a native of Culbertson, Nebraska, is a graduate of the University of Nebraska and of its College of Medicine. He has served as an instructor in psychiatry at the University of Colorado School of Medicine and from 1930 to 1932 was instructor in psychiatry at Yale University School of Medicine. For the last six years he has been senior psychiatrist at the Neuro-Psychiatric Institute.

DR. OSBORN, STATE COMMISSIONER OF HEALTH, INJURED

Dr Stanley H. Osborn was injured on March 12 when his car left the road and turned over near the town of Ashford in Eastford. Dr Osborn was removed to the Day Kimball Hospital in Putnam.

DR. HUNT PRESENTS HIS PLAN

Dr Ernest L. Hunt, of Worcester, Massachusetts, presented his plan of voluntary co-operation of local medical and social service organizations before a meeting in Hartford on March 9 sponsored by the Medical Information Bureau. This plan has been approved by the Council of the Massachusetts Medical Society but as yet has not been put into operation.

HOSPITAL INSURANCE

Hospital insurance in Connecticut is already operating in New Haven, Waterbury, Milford and Norwalk. The plan sponsored by the State Hospital Association and now operating in the above mentioned towns and cities except Norwalk probably will soon be extended throughout the State.

Robert Parnall, manager of the plan, says that the organization has just closed the twelfth enrollment month, and that a little more than 13,000 persons have joined the plan during its first year in New Haven. The figure is about 10 per cent of the population of the city. About a month ago the hospitals in Waterbury were accepted as 'member hospitals,' and residents of Waterbury were elected to the Board of Directors of the plan, which is

case the response of the patient to the liver extract in question was studied particularly with respect to the reticulocyte and red-blood-cell production resulting from the daily administration of a uniform amount of each preparation. The nature of the preparations submitted has been either dry liver extract (*extractum hepatis*), liquid extract of liver (*liquor hepatis*) or parenteral solution of liver (*liquor hepatis purificatus*), as defined in the *U.S. Pharmacopoeia* Eleventh Revision.

Because of the variation in the efficiency of different processes of manufacture, the therapeutic activity of the final product does not necessarily correspond to the amount of liver from which it was derived. It is therefore necessary to define the therapeutic activity of the final product in other terms. Accordingly, the board has assigned to each acceptable preparation a value in terms of units. The amount of material constituting a "unit" is considered to be that amount of material which, when given daily to patients with pernicious anemia, has produced a satisfactory hematopoietic response. Since in the average case material derived from about thirty times as much liver must be given by mouth to produce the same response as when given by injection, it has been necessary to define the "unit" either as an oral unit or as an injectable unit, according to the intended method of administration of each preparation.

Accordingly, it is understood that on labels, bottles or cartons, or in advertising circulars, the manufacturer whose products have been assigned unitage by the board shall no longer state the number of grams of liver employed in making the preparation, but merely either the number of cubic centimeters or grams of material constituting a unit. Depending on the method to be used in the administration of the preparation, the unit will be defined as either an oral unit or an injectable unit. Definition of the number of units in a preparation for oral administration in terms of "injectable" units or vice versa is not permitted. It is further understood that if any dosage is suggested by the manufacturer, the dosage recommended should not be less than one unit a day, whether given daily or at longer intervals. The wording on the label or in the package literature concerning the unitage will give the following information: "The daily (oral, intramuscular) administration of—(no gm., cc.) (capsules, teaspoons, and so forth) of material prepared by the method employed in producing the contents of this (bottle, vial, package, and so forth) has been demonstrated to produce a satisfactory hematopoietic response in pernicious anemia, and constitutes a unit according to the *U.S. Pharmacopoeia* Anti anemia Preparations Advisory Board."

In general it is recommended that, without good evidence that no harm will result, the amount of material administered should probably not be less than one unit a day, whether given daily or in multiple amounts at longer intervals. In many instances it is probable that the clinical indications will render it advisable to give the patient much more than a dosage averaging a unit a day. It must be recognized that the amount of material constituting a unit is determined largely on the basis of the hematopoietic response and does not imply that such an amount is necessarily effective in the control of gastrointestinal or neural manifestations. Furthermore, there is some evidence that the effectiveness of different types of preparations, although similar when defined in terms of units with respect to blood formation, may differ in their effectiveness upon the gastrointestinal or neural manifestations. A full discussion of the indications for the administration of liver preparations is obviously outside the scope of this announcement through the co-operation of

the American Medical Association and the Committee of Revision of the *U.S. Pharmacopoeia*; a special article on this subject has been published, "The Use of Drugs in the Treatment of Anemia" (*J. A. M. A.* 107, 1633-1636, 1936).

The board will, as occasion arises, re-evaluate products based on new clinical data or assign unitage to new products submitted by manufacturers and accepted by the board.

U.S. Pharmacopoeia ANTI ANEMIA
PREPARATIONS ADVISORY BOARD,
C. W. EDMUNDS, M.D., *Chairman*
WILLIAM B. CASTLE, M.D.,
RAPHAEL ISAACS, M.D.,
GEORGE R. MINOT, M.D.,
W. W. PALMER, M.D.

* * *

The Anti-anemia Preparations Advisory Board has designated below the unitage of the acceptable liver products of the following manufacturers and distributors

Abbott Laboratories, North Chicago, Illinois

1 *Liquor Hepatis Purificatus* Parenteral Solution of Liver

In the following dilutions

(a) 0.1 cc. equals 1 unit (injectable)

(b) 0.2 cc. equals 1 unit (injectable)

2 *Extractum Hepatis* Dry Liver Extract

Powder in capsules. 50 capsules (25 gm.) equal 1 unit (oral)

Armour and Company, Chicago, Illinois

1 *Liquor Hepatis* Liquid Extract of Liver
45 cc. equal 1 unit (oral)

2 *Extractum Hepatis* Dry Liver Extract
9 capsules (4.5 gm.) equal 1 unit (oral)

Basic Endocrines, Inc., San Francisco, California

Extractum Hepatis Dry Liver Extract
50 capsules (25 gm.) equal 1 unit (oral)

George A. Breon and Company Inc., Kansas City, Missouri

Liquor Hepatis Purificatus Parenteral Solution of Liver

In the following dilutions

(a) 0.1 cc. equals 1 unit (injectable)

(b) 0.2 cc. equals 1 unit (injectable)

(c) 0.3 cc. equals 1 unit (injectable)

(d) 0.4 cc. equals 1 unit (injectable)

Buffalo Pharmacal Co., Buffalo, New York

1 *Liquor Hepatis Purificatus* Parenteral Solution of Liver

0.2 cc. equals 1 unit (injectable)

2 *Extractum Hepatis* Dry Liver Extract
50 capsules (25 gm.) equal 1 unit (oral)

Carroll Dunham Smith Pharmacal Co., Orange, New Jersey

Liquor Hepatis Purificatus Parenteral Solution of Liver

In the following dilutions

(a) 0.1 cc. equals 1 unit (injectable)

(b) 0.2 cc. equals 1 unit (injectable)

Chappel Laboratories, Rockford, Illinois

1 *Liquor Hepatis Purificatus* Parenteral Solution of Liver

25 cc. equal 1 unit (injectable)

2 *Liquor Hepatis* Liquid Extract of Liver
60 cc. equal 1 unit (oral)

Pratt. He graduated from New York University in 1884 and went to Winsted in February, 1885, to begin the practice of medicine. Named a director of Litchfield County Hospital when it was founded, he had served in that capacity since that time and was a member of both the medical and surgical staffs. He was visiting physician at the William L. Gilbert Home for forty five years. He was a member of the county and national medical societies, Litchfield County University Club and the Second Congregational Church, and a trustee of the Gilbert School and Gilbert Home. He leaves his widow, Elizabeth (Alvord) Pratt, a son, Henry G Pratt, a sister, Miss Ella Pratt, and two grandchildren, Charlotte and Margaret Pratt, all of Winsted.

TUBERCULOSIS BOOKLETS

Two booklets on tuberculosis, one for patients and the other for the "doctor of the future," will be made available this spring by the National Tuberculosis Association and its affiliated groups throughout the country to senior students in Grade A medical schools. Dr Kendall Emerson, managing director of the National Tuberculosis Association, has announced that this is part of the service of the tuberculosis groups to carry on their educational activities among the physicians, as well as among the general public.

In Massachusetts the schools receiving this service are Harvard Medical School, Tufts College Medical School and Boston University School of Medicine.

"To the credit of the American doctor," the booklet for students says, "the record shows that he has from the beginning of the organized fight against tuberculosis generously joined hands with the nonmedical crusader, fully agreeing with him that tuberculosis is not merely a disease of certain tissues but a social problem of first magnitude. This fine record should forever silence the criticism that doctors' interests are too narrowly limited to sick organs."

In its message to the students, the National Tuberculosis Association says, "The hope of eradicating tuberculosis lies in the hands of the doctors of tomorrow."

What You Should Know About Tuberculosis is the title of the booklet written for the patient. It is an interpretative booklet, offered as an aid to the physician in guiding his patient. Its tone is optimistic, and the language is simple.

ANNIVERSARY MEETING OF THE MEDICAL SERVICE, PETER BENT BRIGHAM HOSPITAL

An anniversary meeting in celebration of twenty five years work of the Medical Service of the Peter Bent Brigham Hospital was held in the amphitheater of the hospital on March 31.

At the opening of this department in 1913, Dr Henry A. Christian was physician in-chief, as he is now. The others on the staff at that time were as follows: Channing Frothingham, Jr., physician, Francis W. Peabody, resident physician, I. Chandler Walker, assistant resident physician, Reginald Fitz, house officer in charge of O. D. D., Roger P. Dawson, senior house officer, Wilson G. Smilie, junior house officer, Warren R. Sisson, sub-junior house officer, and Frances Burnham Myles, head nurse, Ward F.

The program included a presentation of three of the first four cases admitted to the service and a talk by Dr Christian on "Certain Concepts of Bright's Disease Based on Twenty Five Years Experience at the Peter Bent Brigham Hospital."

CORRESPONDENCE

LIVER PREPARATIONS CONFORMING TO U.S.P. STANDARDS

To the Editor When liver and stomach preparations were admitted to the *U.S. Pharmacopoeia*, Eleventh Edition, it was recognized that these products presented a different problem, from the viewpoint of standardization, than any question previously before the Committee of Revision.

As no ordinary methods for standardization or testing were available, an advisory board, made up of specialists in the treatment of anemia, was appointed. This board established methods for determining the value of anti-anemia products, and the basis for a U.S.P. "unit of potency." It also issued forms for reporting evidence of clinical value and announced regulations for indicating the potency of U.S.P. products and for the wording of the labels.

On the invitation of the board, a large number of clinical reports were submitted by manufacturers in evidence of the value of their products, and the board, after reviewing these records, herewith submits its conclusions. This first report lists the products which have been approved up to this time as complying with the U.S.P. specifications and the firms authorized to sell or distribute them.

As is probably generally known, only a relatively small group of manufacturers have provided the necessary hospital facilities for checking the clinical value of anti-anemia products as required by the board, and several of these distribute their products through the medium of other pharmaceutical firms.

Having been supplied with adequate clinical evidence of the efficiency of a manufacturer's product and having accepted it as U.S.P. grade with a specific dose, the board, on request, has also authorized the distribution of some of these approved products by other firms when the firms have given assurance that their handling of the products will in no way alter their quality or potency. No doubt the board will later report additional approved preparations and firms.

E. FULLERTON COOK, *Chairman,*
Committee of Revision.

43rd Street and Woodland Avenue,
Philadelphia, Pennsylvania.

* * *

REPORT ON LIVER PRODUCTS BY THE UNITED STATES PHARMACOPOEIA ANTI ANEMIA PREPARATIONS ADVISORY BOARD

The standardization of products for the treatment of pernicious anemia is defined for the first time by the Eleventh Revision of the *U.S. Pharmacopoeia* as follows: "Liver, stomach and other preparations used for this purpose, to be recognized as meeting the specifications of this *Pharmacopoeia* must be approved by the U.S.P. Anti-anemia Preparations Advisory Board. Approved products must have complied with the following specifications: (1) there shall have been submitted from time to time, as requested by the board, satisfactory clinical data from treatment, with the product in question, of cases of Addisonian pernicious anemia, (2) the clinical data submitted shall satisfy the U.S.P. Anti-anemia Preparations Advisory Board that the administration of the material in question, as prepared from liver or stomach, can produce a satisfactory result in the dose given."

In accordance with this requirement, the U.S.P. Anti-anemia Preparations Advisory Board has considered data submitted by various pharmaceutical companies. In each

Ravmer Pharmacal Co., Philadelphia, Pennsylvania
Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.1 cc. equals 1 unit (injectable)

William H. Rorer, Inc., Philadelphia, Pennsylvania
Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.2 cc. equals 1 unit (injectable)

Leonard A. Seltzer Company, Detroit, Michigan
1 Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.1 cc. equals 1 unit (injectable)

Sharp and Dohme, Inc., Philadelphia, Pennsylvania
Extractum Hepatus. Dry Liver Extract.
(a) 50 capsules (25 gm.) equal 1 unit (oral)
(b) 5 vials (25 gm.) equal 1 unit (oral)

G. H. Sherman, M.D., Inc., Detroit, Michigan
Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.2 cc. equals 1 unit (injectable)

The Smith Dorsey Company, Lincoln, Nebraska
1 Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)

United Drug Co., Boston, Massachusetts
Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)

U. S. Standard Products Company, Woodworth, Wisconsin
1 Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)

The Upjohn Company, Kalamazoo, Michigan
1 Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)

Valentine Meat Juice Company, Richmond, Virginia
1 Liquor Hepatus. Liquid Extract of Liver
45 cc. equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 1.0 cc. equals 1 unit (injectable)
(b) 1.5 cc. equal 1 unit (injectable)

The Warren Teed Products Company, Columbus, Ohio
Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)

Western Research Laboratories, Denver, Colorado
Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.4 cc. equals 1 unit (injectable)

The Wilson Laboratories, Chicago, Illinois
1 Extractum Hepatus. Dry Liver Extract.
(a) 50 capsules (25 gm.) equal 1 unit (oral)
(b) 5 vials (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)
(c) 0.3 cc. equals 1 unit (injectable)
(d) 0.4 cc. equals 1 unit (injectable)

Winthrop Chemical Company, New York, New York
Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.1 cc. equals 1 unit (injectable)

The Zemmer Company, Pittsburgh, Pennsylvania
1 Liquor Hepatus. Liquid Extract of Liver
45 cc. equal 1 unit (oral)
2. Extractum Hepatus. Dry Liver Extract.
75 capsules (25 gm.) equal 1 unit (oral)
3. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.4 cc. equals 1 unit (injectable)
(b) 0.1 cc. equals 1 unit (injectable)

The board will, as occasion arises, issue supplementary announcements either as a revaluation of the above products based upon new clinical data or to make a report upon new products which are submitted.

NOTICES

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held on Thursday, April 21, in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), at 8:15 p. m.

PROGRAM

Adrenalin Sensitivity in Hyperthyroidism. Dr. Emil Goetsch, professor of surgery, Long Island College of Medicine.

The Value of Antitoxin in Scarlet Fever. Dr. Francis G. Blake, Sterling Professor of Medicine, Yale University School of Medicine.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary*

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Wednesday, April 20, at 12 o'clock noon. *Note change of day and date.*

Dr. Allan M. Butler and Dr. David L. Lionberger will discuss Principles and Proposals.

All physicians are cordially invited to attend.

JOHN B. HALL, M.D., *Secretary*

- Chemical Works of Gedeon Richter, Inc., Budapest, Hungary
Liquor Hepatus Purificatus Parenteral Solution of Liver
2 cc. equal 1 unit (injectable)
- Cheplin Biological Laboratories, Syracuse, New York
Liquor Hepatus Purificatus Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.4 cc. equals 1 unit (injectable)
- The Columbus Pharmacal Co., Columbus, Ohio
Liquor Hepatus Purificatus Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)
- Direct Sales Company, Inc., Buffalo, New York
Extractum Hepatus Dry Liver Extract.
(a) 5 vials (25 gm.) equal 1 unit (oral)
(b) 50 capsules (25 gm.) equal 1 unit (oral)
- The Drug Products Co., Inc., Long Island City, New York
Liquor Hepatus Purificatus Parenteral Solution of Liver
0.1 cc. equals 1 unit (injectable)
- Ethko Chemical Products Co., New York, New York
Liquor Hepatus Purificatus Parenteral Solution of Liver
0.4 cc. equals 1 unit (injectable)
- Flint Eaton and Company, Decatur, Illinois
1 Extractum Hepatus Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)
- C. E. Jamieson and Company, Detroit, Michigan
Extractum Hepatus Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
- Jensen-Salsbery Laboratories, Inc., Kansas City, Missouri
Liquor Hepatus Purificatus Parenteral Solution of Liver
0.4 cc. equals 1 unit (injectable)
- Kremers-Urban Company, Milwaukee, Wisconsin
Extractum Hepatus Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
- The Lakeside Laboratories, Milwaukee, Wisconsin
Liquor Hepatus Purificatus Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)
- Lederle Laboratories, Pearl River, New York
1 Liquor Hepatus Liquid Extract of Liver
60 cc. equal 1 unit (oral)
2 Liquor Hepatus Purificatus Parenteral Solution of Liver
(a) 0.06 cc. equals 1 unit (injectable)
(b) 0.3 cc. equals 1 unit (injectable)
- Eli Lilly and Company, Indianapolis, Indiana
Extractum Hepatus Dry Liver Extract.
3 vials (12.75 gm.) equal 1 unit (oral)
- The Maltbie Chemical Co., Newark, New Jersey
Extractum Hepatus Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
- The S. E. Massengill Co., Bristol, Tennessee
1 Extractum Hepatus Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2 Liquor Hepatus Purificatus Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)
(c) 0.4 cc. equals 1 unit (injectable)
- McNeil Laboratories, Inc., Philadelphia, Pennsylvania
1 Extractum Hepatus Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus Parenteral Solution of Liver
0.2 cc. equals 1 unit (injectable)
- The William S. Merrell Company, Cincinnati, Ohio
Extractum Hepatus Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
- Metropolitan Laboratories, New York, New York
Liquor Hepatus Purificatus Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.4 cc. equals 1 unit (injectable)
- Montgomery Ward and Co., Chicago, Illinois
Extractum Hepatus Dry Liver Extract.
75 capsules (25 gm.) equal 1 unit (oral)
- The National Drug Company, Philadelphia, Pennsylvania
1 Extractum Hepatus Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2 Liquor Hepatus Purificatus Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)
(c) 1.0 cc. equals 1 unit (injectable)
- Parke, Davis and Company, Detroit, Michigan
1 Extractum Hepatus Dry Liver Extract.
6 vials (24 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus Parenteral Solution of Liver
2.0 cc. equal 1 unit (injectable)
- Pitman Moore Company, Indianapolis, Indiana
Liquor Hepatus Purificatus Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)
- Premo Pharmaceutical Laboratories, Inc., New York, New York
Extractum Hepatus Dry Liver Extract.
(a) 50 capsules (25 gm.) equal 1 unit (oral)
(b) 5 vials (25 gm.) equal 1 unit (oral)

Ravmer Pharmacal Co., Philadelphia, Pennsylvania

Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.1 cc. equals 1 unit (injectable)

William H. Rorer, Inc., Philadelphia, Pennsylvania

Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.2 cc. equals 1 unit (injectable)

Leonard A. Seltzer Company, Detroit, Michigan

1. Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.1 cc. equals 1 unit (injectable)

Sharp and Dohme, Inc., Philadelphia, Pennsylvania

Extractum Hepatus. Dry Liver Extract.
(a) 50 capsules (25 gm.) equal 1 unit (oral)
(b) 5 vials (25 gm.) equal 1 unit (oral)

G. H. Sherman, M.D., Inc., Detroit, Michigan

Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.2 cc. equals 1 unit (injectable)

The Smith Dorsey Company, Lincoln, Nebraska

1. Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)

United Drug Co., Boston, Massachusetts

Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)

U. S. Standard Products Company, Woodworth, Wisconsin

1. Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)

The Upjohn Company, Kalamazoo, Michigan

1. Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)

Valentine Meat Juice Company, Richmond, Virginia

1. Liquor Hepatus. Liquid Extract of Liver
45 cc. equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 1.0 cc. equals 1 unit (injectable)
(b) 1.5 cc. equal 1 unit (injectable)

The Warren-Teed Products Company, Columbus, Ohio

Extractum Hepatus. Dry Liver Extract.
50 capsules (25 gm.) equal 1 unit (oral)

Western Research Laboratories, Denver, Colorado

Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.4 cc. equals 1 unit (injectable)

The Wilson Laboratories, Chicago, Illinois

1. Extractum Hepatus. Dry Liver Extract.
(a) 50 capsules (25 gm.) equal 1 unit (oral)
(b) 5 vials (25 gm.) equal 1 unit (oral)
2. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.1 cc. equals 1 unit (injectable)
(b) 0.2 cc. equals 1 unit (injectable)
(c) 0.3 cc. equals 1 unit (injectable)
(d) 0.4 cc. equals 1 unit (injectable)

Winthrop Chemical Company, New York, New York

Liquor Hepatus Purificatus. Parenteral Solution of Liver
0.1 cc. equals 1 unit (injectable)

The Zemmer Company, Pittsburgh, Pennsylvania

1. Liquor Hepatus. Liquid Extract of Liver
45 cc. equal 1 unit (oral)
2. Extractum Hepatus. Dry Liver Extract.
75 capsules (25 gm.) equal 1 unit (oral)
3. Liquor Hepatus Purificatus. Parenteral Solution of Liver
In the following dilutions
(a) 0.4 cc. equals 1 unit (injectable)
(b) 0.1 cc. equals 1 unit (injectable)

The board will, as occasion arises, issue supplementary announcements either as a revaluation of the above products based upon new clinical data or to make a report upon new products which are submitted.

NOTICES

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held on Thursday, April 21, in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), at 8:15 p. m.

PROGRAM

Adrenalin Sensitivity in Hyperthyroidism. Dr. Emil Goetsch, professor of surgery, Long Island College of Medicine.

The Value of Antitoxin in Scarlet Fever. Dr. Francis G. Blake, Sterling Professor of Medicine, Yale University School of Medicine.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary*

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Wednesday April 20, at 12 o'clock noon. *Note change of day and date*

Dr. Allan M. Butler and Dr. David L. Lionberger will discuss Principles and Proposals.

All physicians are cordially invited to attend.

JOHN B. HALL, M.D., *Secretary*

COURSE IN OCCUPATIONAL DERMATOSES

During May, 1938, a course in occupational dermatoses will be given under the auspices of the Harvard School of Public Health. Lectures will be given on the clinical manifestations, aspects, and so forth. Clinics will be held at the Massachusetts General Hospital, and at the offices of various insurance companies. Visits to some of the more important factories will be arranged, so that students may study industrial processes and preventive measures. The number of students will be limited to ten. Further information and registration blanks may be obtained from the Dean of the Harvard School of Public Health, 25 Shattuck Street, Boston, Mass.

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve-thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen, discussed, and when indicated, treated with radium and high voltage x ray. Physicians are welcome to visit this clinic and bring patients to the clinic for diagnosis.

BOSTON CITY HOSPITAL

The monthly conference of clinical pathology will be held at the Boston City Hospital on Wednesday, April 13, at 12 o'clock noon, in the pathological amphitheater.

JOSEPH E. HALLISEY, M.D., *Secretary,*
Medical Staff.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, APRIL 11

TUESDAY APRIL 12

- *9 10 a m Boston Dispensary Vitamin A Deficiency in Adults.
Dr Harold J. Jeghers
- *10 a m 12.30 p m Tumor clinic Boston Dispensary

WEDNESDAY APRIL 13

- *9 10 a m Boston Dispensary Hospital case presentation Dr S J Thannhauser
- *12 m Clinicopathological conference. Children's Hospital amphitheater
- 12 m Boston City Hospital pathological amphitheater Monthly conference of clinical pathology

THURSDAY APRIL 14

- 8 30-9 30 a m Exchange visit, surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals, held this week at the Children's Hospital
- *9 10 a m Boston Dispensary Transurethral Prostatic Resection
Dr P N Papas and Dr Harold A Chamberlin.

FRIDAY APRIL 15

- *9 10 a m Boston Dispensary Acid Base Balance in Health and Disease. Dr John H Talbott.
- *10 a m 12.30 p m Tumor clinic Boston Dispensary
- 12 m Clinical meeting of the children's medical service, Massachusetts General Hospital Ether Dome.

SATURDAY APRIL 16

- *9 10 a m Boston Dispensary Hospital case presentation. Dr Thannhauser
- *10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A Christian

Open to the medical profession

APRIL 13 — Boston City Hospital pathological amphitheater Conference on clinical pathology. Notice above.

APRIL 13 — New England Dermatological Society Page 584 issue of March 31

APRIL 13 — New Bedford Cancer Clinic Page 546, issue of March 24

APRIL 13 — Eastern Hampden Medical Association Page 499 issue of March 17

APRIL 14 — Pentucket Association of Physicians Hotel Bartlett 95 Main Street Haverhill 8 30 p m

APRIL 18 — Boston Medical History Club Boston Medical Library 8 Fenway Boston

APRIL 18 19 and 20 — Thomas William Salmon Memorial Lecture Page 450 issue of March 10

APRIL 20 — South End Medical Club Page 623

APRIL 21 — Harvard Medical Society Page 623

APRIL 22 — Symposium in Honor of Dr Jelliffe. Page 583 issue of March 31

APRIL 23 — Massachusetts Memorial Hospitals annual reunion of house officers alumni association Page 546 issue of March 24

APRIL 26 — New England Society of Psychiatry Page 322 issue of February 17

MAY 16 and 17 — American Neisserian Medical Society Page 551, issue of March 31

MAY 31 JUNE 1 and 2 — Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

JUNE 6 7 8 and 9 — American Association of Industrial Physicians Page 499 issue of March 17

JUNE 13-17 — American Medical Association San Francisco.

JUNE 13 OCTOBER 8 and NOVEMBER 15 — American Board of Ophthalmology Page 282 issue of February 10

SEPTEMBER 12 14 — American Association for the Study of Gout Page 545 issue of March 24

OCTOBER 17 21 — Clinical Congress of the American College of Surgeons, New York City

OCTOBER 24 26 — Academy of Physical Medicine, scientific session. Washington, D C.

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5 — 5 p m. New Bedford

ESSEX SOUTH

MAY 5 — Censors meet at Salem Hospital 3 30 p m

MAY 11 — Annual meeting Salem Country Club Peabody Dinner at 7 p m Speaker and subject to be announced

FRANKLIN

Meeting will be held at the Franklin County Hospital, Greenfield, at 11 a m the second Tuesday of May

HAMPDEN

Meetings will be held on the fourth Tuesday in April and July

HAMPSHIRE

MAY 11 — Page 546 issue of March 24

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club Stoneham, at 12 15 p m on May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27

NORFOLK DISTRICT

MAY — Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

Meetings held at 12 noon.

MAY 5 — Annual meeting at 12 noon

PLYMOUTH

Meetings will be held at 11 a m on April 21 May 19 and July 21

WORCESTER

APRIL 13 — Hahnemann Hospital Worcester Dinner will be at 6 15 to be followed by business session and scientific program.

MAY 11 — Afternoon and evening annual meeting Place and schedule of program to be announced.

BOOKS RECEIVED FOR REVIEW

Operative Gynecology Harry Sturgeon Crossen and Robert James Crossen. Fifth edition 1076 pp St. Louis The C V Mosby Company, 1938. \$12.50

Theoretical Principles of Roentgen Therapy Edited by Ernst A Pohle. 271 pp Philadelphia Lea & Febiger, 1938 \$4.50

Milestones in Medicine Luty lectures of the New York Academy of Medicine 276 pp New York and London D Appleton Century Company, 1938 \$2.00

Clinical and Experimental Investigations in Agranulocytosis With special reference to the etiology Preben Plum. 410 pp Copenhagen Nyt Nordisk Forlag, London H. K. Lewis & Co, Ltd., 1937 18/-

Essentials of Prescription Writing Cary Eggleston. Sixth edition, revised. 155 pp Philadelphia and London W B. Saunders Company, 1938 \$1.50

Surgical Diseases of the Mouth and Jaws Earl Calvin Padgett. 807 pp Philadelphia and London W B Saunders Company, 1938 \$10.00

The Physician's Business Practical and economic aspects of medicine George D Wolf. 384 pp Philadelphia, London, New York and Montreal J B Lippincott Company, 1938 \$5.00

Handbook on Nasal Accessory Sinuses Frank L. Allogway. 121 pp Kingsport, Tennessee Kingsport Press, Inc., 1937 \$2.00

Malnutrition the Medical Octopus John Preston Sutherland. 368 pp Boston Meador Publishing Company, 1937 \$3.00

Alcohol One man's meat Edward A. Strecker and Francis T Chambers, Jr. 230 pp New York The Macmillan Company, 1938 \$2.50

Man Against Himself Karl A. Menninger. 485 pp New York Harcourt, Brace and Company, 1938 \$3.75

Diseases of Women for the General Practitioner Paul Titus. Edited by Morris Fishbein. 320 pp New York National Medical Book Co., Inc., 1937 \$4.00

The Conquest of Cholera America's greatest scourge J S. Chambers. 366 pp New York The Macmillan Company, 1938 \$4.75

Digestive Tract Pain Diagnosis and treatment, experimental observations Chester M. Jones. 152 pp New York The Macmillan Company, 1938 \$2.50

Sir Kenelm Digby Writer bibliophile and protagonist of William Harvey John F. Fulton. 75 pp New York Peter and Katharine Oliver, 1937 \$5.00

BOOK REVIEWS

Short Years The life and letters of John Bruce MacCallum M.D. 1876-1906 Archibald Malloch. 343 pp Chicago Normandie House, 1938 \$3.50

Dr Malloch has interspersed in this fascinating narrative of the life of one of the most promising young scientists that American medicine has produced, selections from his voluminous correspondence, and memories which appear in his notebooks. With this intimate picture of MacCallum's intellectual development is an account of his many valuable contributions based upon his studies in embryology, histology, physiology and pharmacology, many of which were made during his medical school career, and all within the period between 1892 and 1906. Paralleling this scientific activity in point of time and equaling it in literary interest is a small but select group of prose and poetic writings reflecting a philosophy of life uncommon to the pure scientist.

There seems to have been something imparted to the students in the Canadian schools that fostered qualities in them that we have been taught to expect and have come so much to admire—a breadth of view and an imaginative insight accentuating the keenly scientific temperament. We have only to recall Sir William Osler and Jack McCrae, not to mention Archibald Malloch, himself, the author of this memoir.

Osler's earlier years find their counterpart in MacCallum's early youth. Both were intensely interested in natural history and were meticulously accurate in observation and the recording of their facts. In his struggle with the disease which from the very beginning of his career

fastened itself upon him, one is reminded of Robert Louis Stevenson, and as with him, so with MacCallum, the reader is torn between admiration for the fortitude with which he bore his affliction and the variety and extent of his accomplishments. It is this that constitutes one of the principal charms of this delightful narrative.

Born in Dunnville, Ontario, in 1876, receiving his preliminary education at home and his collegiate training at the University of Toronto, he came under the influence of Mall, Osler, Welch and the remarkable group of teachers at Johns Hopkins in 1896. Owing to the condition of his health he was obliged to seek for occupation in a climate suited to his physical infirmities. For a time he was in practice in Denver and then took a position in the University of California with Professor Loeb, it was there that the rest of his life was passed and much of his scientific work was accomplished, subject to numerous interruptions because of exacerbations of his tuberculosis. It was there, also, that death overtook him, suddenly, in 1906, terminating a career of great promise just as he was entering upon his thirtieth year.

This book should be a stimulus to every medical man and for that matter to everyone for whom science and the humanities hold any appeal.

Mental Therapy Studies in fifty cases Louis S. London.

Vol. 1 and 2 1201 pp New York Covici, Friede, Publishers, 1937 \$12.50

These two volumes are an extensive treatise on psychoanalysis illustrated by fifty detailed case histories which are reported in a clear and interesting style and with a serious scientific approach. The reviewer agrees with the author's statement that psychiatry and psychoanalysis are interwoven, an analyst without a knowledge of psychiatry is compared with an internist who does not know pathology, or a surgeon who is ignorant of anatomy.

At first the author had a Freudian analytic training, but later he worked with Stekel on dream analysis and investigated his active technique. Many of the analyses in this book are carried out by means of dream interpretation, the dreams are symbolically interpreted and the author, under Stekel's influence, makes dream symbolism the center not only of dream investigation but also of the technique of psychoanalysis. By this progressive dream analysis and an active intervention in the life of the patient, Stekel shortened the time required, as he believed that lengthy analyses were undesirable. The reviewer feels that this kind of analysis is merely a superimposed intellectual interpretation, as the complete working through of the neuronic conflicts requires a longer time. It is true that short analyses may relieve neuronic symptoms, but they do not eliminate the unconscious roots of the neurosis. However, in fairness to the author, it must be remembered that he states on page 277 of the first volume that dreams cannot be analyzed according to a stereotyped symbolism, the free associations of the patient must be connected to the manifest dream content before the cryptic meaning of the dream can be solved. Many of the author's analyses are of considerable length.

The book is divided into six parts and discusses, in turn, metapsychology, psychosexual psychology and pathology, the various neuroses, sexual perversions, and psychoses. The author believes that much can be done for schizophrenia if the analysis is begun in the early stages of the disease but the analytic therapy is fraught with great difficulties due to the incomplete transference.

In the chapter 'Psychosexual Pathology of the Sexual Instinct', the author develops a theory which involves "traumatization of the libido. This trauma liberates

the components of homosexuality, perversion and narcissism. It must be pointed out that this viewpoint is not new, as it is generally admitted that the libido is always traumatized in anxiety situations. Furthermore, he interprets narcissism as abnormal, whereas it is generally accepted that narcissism is not a perversion but exists in every living creature.

These volumes give the impression that more importance is attached to the analytic material and dream symbolism than to the usual procedure of the dynamic interpretation of the analytic situation, the latter is always indicated, but perhaps too briefly.

A Pediatrician in Search of Mental Hygiene Bronson Crothers 271 pp New York The Commonwealth Fund, 1937 \$2.00

This book, which for the purpose of clarity and completeness, has been conveniently divided into three sections, represents a thorough and careful study of the present confused positions of the pediatrician, psychiatrist, psychologist and social worker in the field of mental hygiene, and offers a tentative plan whereby an intelligent and practical solution may be evolved for the benefit of the patient and to the satisfaction of those concerned. As the author states he is not interested 'in perfecting a blend of the various virtues of each, nor in supervising a 'job analysis,' but in discovering ways of co-operation between them, which will enrich the knowledge of the pediatrician and contribute to the health of the child.' Since the field of pediatrics has progressively broadened, it is natural that mental hygiene should at least be recognized by the pediatrician, but at the same time the pediatrician should realize that neither previous training nor time qualifies him to be the director of such an organized unit. His position should be that of adviser to the group and to the parents. If such an arrangement could be reached, both the psychiatrist and the pediatrician would be in a better position to understand the scope and interrelation of their respective work. Dr Crothers stresses the importance of the pediatrician's principal duty, which is the treatment of organic diseases as they occur in children and not the practice of psychiatry. The importance and necessity of an intern's thorough knowledge of these organic disturbances is also discussed, but at the same time he points out how a competently directed clinic conducted in a children's hospital can give both the student and the intern adequate training to appreciate the mental as well as the physical aspect of the child. The entire volume is written in the frank and straightforward manner so characteristic of the author, and should prove of value to all who read it.

The Physician's Business. Practical and economic aspects of medicine George D Wolf 384 pp Philadelphia, London, New York and Montreal J B Lippincott Company, 1938 \$5.00

This book is an interesting compilation of the ethical principles governing medical practice, together with associated problems which may be studied with profit by all groups of physicians, and especially by those students who are about to graduate from medical schools, because it depicts the responsibilities and opportunities facing the hospital intern and his subsequent years of practice.

Adequate space is devoted to medical economics and the practitioner's financial problems with appropriate advice as to ways and means by which to secure material success.

Although some space is given to a discussion of comparatively simple household problems, which have little to do with the practice of medicine, the observations and advice given furnish interesting reading which will be appreciated by many.

The book closes with a chapter devoted to the "Trends in Medical Practice," with the associated controversies before the public and the profession, but without a solution of the questions under discussion.

This volume contains a great deal of useful information and sound advice which warrants careful reading.

Sir Kenelm Digby. Writer, bibliophile and protagonist of William Harvey John F Fulton 75 pp New York Peter and Katharine Oliver, 1937 \$5.00

An exhibit of works by and about Sir Kenelm Digby, largely from the collection of the author, was shown at the Grolier Club in New York City in April and May, 1937. As an introduction to the demonstration of this superb collection, Professor Fulton has written an explanation, including a brief life of Digby, an estimation of his character, and an interpretation of the value of his work to medicine. Digby's life was an exceedingly dramatic one and he lived in a time which was marked by extreme activity. Digby is known as a collector of books, a pirate in the Mediterranean, a famous lover, and a protagonist of William Harvey. Although Digby's physiology was mainly Galenical, he accepted Harvey and attempted to harmonize the new ideas about the circulation of the blood with a well systematized scheme of bodily function. Digby was also in close touch with Descartes during his years in Paris and it seems probable that Digby's ideas in regard to reflex action came directly from Descartes. Digby must, therefore, be considered as one of the early supporters of the modern conception of the nervous system.

Professor Fulton feels that Digby's scientific life has been neglected. There has been much written about his position in philosophy, his powerful influence as a patron of letters and his extraordinary gift as a letter writer, but few have noticed his relations with William Harvey or with Descartes.

This book, from a private press, is beautifully gotten up, with superb illustrations and a most pleasing type of print as well as cover. In contents, as well as in appearance, it is a choice item and the individual must be considered fortunate who owns one of the three hundred copies which have been printed.

A Textbook of Ophthalmology Sanford R. Gifford 492 pp Philadelphia and London W B Saunders Company, 1938 \$4.00

This textbook was written for the use of the medical student or the general practitioner making his first contact with the field of ophthalmology. For the beginner, it is desirable that a text be interesting, lucid in expression and informative in illustration. Gifford's text meets these requirements, and it shows evidence of wisdom in deciding what to omit as well as what to include for the beginner. Of the 492 pages of the text, 62 pages are used to outline methods of examination of the eye, and 30 pages to index the contents.

For the purpose for which it was written, Gifford's text may be regarded as a classic. Its effectiveness is enhanced by 249 well-executed illustrations, and by 10 color plates.

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HETEROTOPIC GASTRIC MUCOSA

ARTHUR R. KIMPTON, M.D.,* AND A. REYNOLDS CRANE, M.D.†

BOSTON

HETEROTOPIC gastric mucosa in the small intestine is extremely rare except for its occurrence in remnants of the omphalomesenteric duct (Meckel's diverticulum). In the literature we have been able to find only 3 reported cases of ectopic gastric mucosa in the small intestine below the duodenum that were not associated with remnants of the vitelline duct. Two of these lesions occurred in the ileum and the third was found in the first portion of the jejunum. The first case was reported in 1912 by Pondecker,¹ who found a nodule composed of gastric epithelium containing both chief and parietal cells in the ileum of a girl of nine with symptoms of ileus. In 1927 Taylor² reported the second case of ectopic gastric mucosa in the ileum of a male child seventeen months of age with ulceration and death from hemorrhage. The heterotopic epithelium in this case also contained both chief and oxyntic cells. The lesion was found to be on the mesenteric border of the ileum, which, as Taylor concluded, is evidence against its being connected with a Meckel's diverticulum. The only reported instance of gastric mucosa occurring in the jejunum that we have been able to find in the literature was recorded by Bartak³ in 1932. In his case a nodule was found protruding from the serosal surface of the first portion of the jejunum in the course of a laparotomy for gastric ulcer. Histologically the nodule was described as containing both gastric epithelium with chief and parietal cells and islands resembling pancreatic acini. The tumor involved all layers of the intestinal wall, although no specific mention is made of the condition of the overlying mucosa. In view of the rarity of this condition, and the fact that we have had the opportunity to observe a case unlike any that has been previously recorded in the literature, we report the following case.

CASE REPORT

J. B., a 7-year-old girl, was seen in consultation* by one of us (A. R. K.) because of recurrent attacks of severe paraumbilical pain associated with nausea and vomiting since the age of 3. She was born at full term after a normal pregnancy, the fifth child in a family of nine. Her weight at birth was 8¾ lb and no physical abnormalities were noted. Her parents and siblings were entirely normal, and there were no pertinent factors in her past history other than those associated with her present illness.

The first abdominal complaint occurred at the age of 3, and was manifested by severe pain about the umbilicus, not localized, and marked by a continuous ache with occasional attacks of excruciating pain causing her to cry out. After 2 or 3 hours the child vomited with relief of the pain. Similar attacks occurred subsequently from three to six times a year. They lasted from 1 to 3 days, and began during the night as frequently as during the day. Following each attack the child appeared perfectly normal except for a sense of weakness. Fever never developed during any of the attacks. The mother always gave the child a laxative, this was invariably followed by a watery defecation, but at no time were the stools abnormally dark or bloody. The attacks gradually became more frequent and severe, but no definite inducing factor was ever noted. Two years after the onset of this condition a physician was consulted for the first time and a diagnosis of intestinal worms was made. Three weeks later a second physician was consulted and for the first time an abdominal mass was palpated, the mother stated that a mass could be seen especially when the pain was severe. At this time a diagnosis of volvulus was made, the abdomen was tightly strapped with tape, and abdominal massage and shaking the child in an upside-down position by holding the feet were advised. Following this the attacks were much less frequent. One year later, because of a severe attack, the patient was referred to a hospital, where x-rays of the intestinal tract revealed nothing. During the past year she had had attacks of varying severity every 4 or 5 weeks. She was seen in consultation on June 21, 1937, having just suffered an acute attack of abdominal pain.

Physical examination was negative save for the abdomen, where an elongated tumor could be felt extending diagonally across the abdomen from left to right, being 10 or 12 cm. in length, 2 or 3 cm. in width, soft, smooth and non-tender. The center of the mass lay just beneath the umbilicus. The appearance was quite typical of intussusception. While lying quietly on the examining table the

*Surgeon-in-chief, First Surgical Service, Boston City Hospital.

†Instructor in pathology, Tufts College Medical School; first assistant to the pathologist, Mallory Institute of Pathology, Boston City Hospital.

*Patient seen in consultation with Dr. F. J. Hand at the Exeter Hospital, Exeter, New Hampshire.

child suddenly screamed, doubled up, holding her abdomen, became pallid and perspired profusely. This lasted for about 10 minutes and was followed in a few minutes by a similar attack. The abdominal tumor became very prominent through the child's thin abdominal wall, while the pain was most severe. She was given gas-oxygen inhalation until surgical relief could be obtained.

At operation, the abdomen was exposed by a left para-umbilical mid rectus incision and a large intussusception of the jejunum was found starting about 15 cm below the ligament of Treitz. The bowel was edematous but entirely viable, and the intussusception was reduced with ease. When completely reduced, a soft, dough like tumor mass was found filling the entire lumen of the jejunum 20 cm below the ligament of Treitz. This was resected without difficulty by removing 12 cm of jejunum, and a side-to-side anastomosis was done. The abdomen was closed in layers without drainage.

The immediate postoperative course was uneventful. Six months after the operation the child is healthy and has had no recurrence of her previous symptoms.

Pathological Report The gross specimen consisted of a piece of small intestine (jejunum) measuring 7 by 5 by 0.4 cm. The serosa was negative but the entire wall

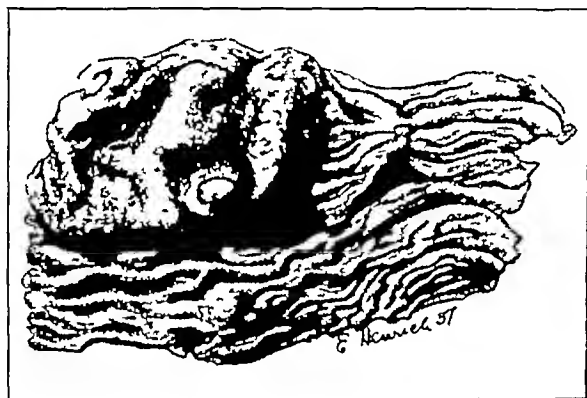


Figure 1 Gross specimen showing tumor nodule and jejunum. The gross resemblance of the mucosal surface of the tumor nodule to gastric mucosa is striking. About actual size.

was thickened and edematous, although not otherwise remarkable. The mucosa in one area was redundant, measuring 3 cm. in diameter and being elevated 0.4 cm. above the surrounding tissue to form a definite tumor nodule with a broad base. There was no evidence of infiltration of the underlying tissues.

Histologic sections through the redundant portion of mucosa showed it to be composed of long mucous glands of the gastric type in some of which numerous large, round, eosinophilic parietal cells could be readily identified. At the margin of the nodule there was an abrupt transition to a mucosa of the jejunal type, with many large plicae circulares and numerous goblet cells. The tumor nodule itself lay entirely on the mucosal side of the muscularis mucosa, and the redundancy of the mucosa noted in gross examination was due entirely to the numerous gastric glands of which the tumor was composed. There were occasional mitotic figures in the epithelium, but the cells were perfectly differentiated into adult chief and parietal cells, as found in the mucosa of the stomach. The submucosa, muscularis and serosa were normal save for evident intercellular edema.

DISCUSSION

This case is essentially a typical one of intussusception, but is unusual and of interest because of the embryologic anomaly which was responsible.



Figure 2 Low-power view of junction of tumor with normal mucosa. Note the abrupt transition in the character of the epithelium, and that the gastric mucosa occurs entirely above the muscularis mucosa. Hematoxylin and eosin, 9X.

for the intussusception. The role of tumors in the production of intussusception, particularly in the adult, has been emphasized by recent investigators,^{4, 5, 6} although the association of the two

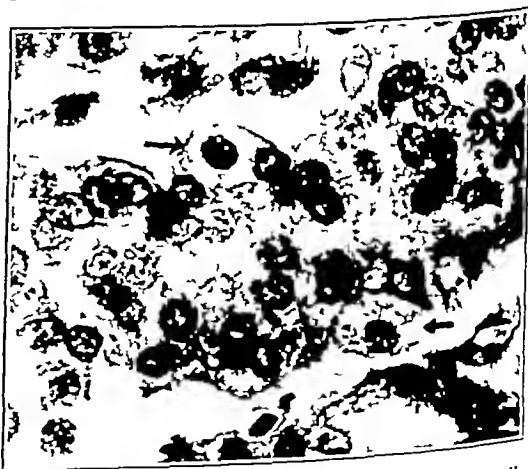


Figure 3 High power field of the tumor mucosal cells, showing large, round parietal cells (indicated by arrows). Hematoxylin and eosin, 900X.

lesions has long been recognized. Roan, in reporting a series of cases of intussusception, states that tumors are a negligible factor in children up to the age of three. Since benign tumors are much commoner than malignant ones in the small intes-

ture they predominate in any analysis of tumors causing intussusception. Nevertheless, the polypoid nature of many benign intestinal neoplasms renders them even more potent factors in the general etiology of intussusception. In all reported series the commonest types of tumors encountered are myomas and adenomas, although instances of fibroma, lipoma, hemangioma and other benign tumors are not infrequent.

The occurrence of ectopic gastric mucosa has been frequently observed in the esophagus and in vestiges of the vitelline duct. Nicholson¹ states that there is an incidence of as high as 75 per cent in the upper part of the esophagus. The frequent occurrence of gastric mucosa in Meckel's diverticulum is well known. Curd⁸ in a study of Meckel's diverticulum gives an incidence of 13 per cent in reported cases while Hudson and Koplik⁹ in a report of 32 cases found gastric mucosa in 52 per cent. The role of secretion of these gastric elements leading to ulcer and hemorrhage has been emphasized by Kleinschmidt¹⁰ and others.^{9, 11} Heterotopic gastric mucosa has been noted in the duodenum by Taylor.² Nicholson¹ in an extensive study of heteromorphoses of the alimentary tract reports elements of gastric mucosa in a cyst of the pancreas, a gall bladder, a Meckel's diverticulum and tuberculous ulcers of the colon, although these were merely based on the occurrence of gastric-like cells which did not store or produce mucin in a stainable form as do the goblet cells of the small and large bowel. Stone¹² and Nicholson¹³ reported ectopic gastric mucosa in the umbilicus, probably representing a remnant of the vitelline duct.

The reasons for the development or existence of this type of abnormality are entirely unknown, although numerous theories have been suggested. We agree with Nicholson,¹³ who concludes that the developmental heteromorphoses indicate that the original prospective potencies of cells are wider than their prospective values, and that the accidental heteromorphoses suggest that the original prospective potencies are not entirely lost during development, since they are sometimes accidentally revealed in pathologic states in old age. In other words, one must bear in mind the common origin of the intestinal epithelium and realize that each cell may differentiate in various ways. This, however, carries us no closer to the pathogenesis of such lesions, beyond removing the necessity of explaining all such findings on the basis of embryologic rests. Curd⁸ reviews the various theories of origin and development of ectopic gastric mucosa. Briefly stated, these are

(1) The presence of a substance in the intestines which stimulates the formation of intestinal mucosa, and the lack of which is necessary for the formation of gastric mucosa. This substance was thought to be bile.

(2) An inflammatory process in the endoderm during some stage of embryologic development.

(3) Misplaced fetal inclusions or rests.

(4) The rapid growth of the intestines does not allow the differentiation of cells into the gastric type, while the smaller size and slower growth of the stomach allow for complete differentiation of the stomach mucosa.

The first theory has long since been proved incorrect, and is only further disproved by our case. The theory of rapid development of the intestines is likewise ruled out by this case, since we know of no specific difference in the rate of development of the jejunum and other portions of the intestines, and since the tumor covered a fairly wide expanse of mucosal surface. In the light of our present knowledge it is impossible to conclude what mechanism governs the development of ectopic gastric mucosa. We believe that the origin lies in the potentialities of the epithelial cells of the intestinal tract, but we are unable to explain their further development along other lines of differentiation.

SUMMARY

An instance of a jejunal tumor composed of ectopic gastric mucosa and leading to intussusception is reported.

The role of tumors in the production of intussusception is briefly discussed.

The occurrence of gastric mucosa in the small intestine and the theories of its origin and development are reviewed.

The authors are indebted to Dr. G. Kenneth Mallory for his assistance in preparing the illustrations.

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THE HINTON TEST

V Adult Congenital Syphilis Otherwise Undetected

AUSTIN W CHEEVER, M D *

BOSTON

IN THE days of Hutchinson and Fournier a definite diagnosis of congenital syphilis was rarely made except on unmistakable clinical evidence. When the Wassermann test came into general use, not only were such cases found to have positive reactions, but numerous others were also. Some cases of congenital syphilis were disclosed in persons who had reached adult life without its existence having been suspected. Now that experience has shown that the Wassermann test fails to detect many cases of syphilis, we know that many have continued to escape detection. It was inevitable that the advent of the Hinton test, with its greater sensitivity, should bring to light a large number of latent cases. Some of these were congenital and remained undetected until maturity, since they had shown no clinical signs.

It is always important to differentiate congenital and acquired syphilis, for the following reasons. The emotional suffering can usually be lessened by the patient's knowledge that he or she is not to blame for the disease. The care is quite different, inasmuch as congenital syphilitic adults usually require no treatment. The mate and the offspring of a congenital syphilitic will not be affected, and women may need no treatment during pregnancy. Younger siblings, under eighteen or perhaps twenty, and still within the age of congenital syphilitic accidents, may be saved from damage.

Too often the possibility of the congenital form of this disease is not thought of unless the patient exhibits marked stigmas, such as typical Hutchinsonian teeth, an active interstitial keratitis or a strikingly typical history of infant tragedies in siblings. It is true that many cases show exceedingly slight evidence of congenital syphilis, but careful study of the case will generally suffice to establish the diagnosis. Very few writers have adequately emphasized the need of considering the possibility of congenital syphilis in adults, and the necessity for intensive study of the individual for slight stigmas and of his family for corroborative evidence.

Stoll¹ called attention to this group of syphilitics some years ago, he urged physicians to make wider use of their detective abilities, to give closer consideration to stigmas, slight as well as marked, to pay more attention to family studies, and to make

an intelligent and liberal use of the Wassermann test. "Within the last few years," he said, "I have been consulted by a number of adults whose symptoms were due to prenatal syphilis, unrecognized until irreparable damage had been done." He showed that when a physician's level of suspicion was sufficiently high, he was sure to find a surprisingly large number of cases of congenital syphilis that would otherwise go unnoticed. It is well known that the seriousness of congenital syphilis tends to decrease with time from infancy when it causes many deaths, through childhood when it causes local complications, to early adult life when there is relative freedom from even local manifestations. Similarly, the blood reactions tend to become negative even when the patient is given no treatment. The Wassermann test turns negative much earlier than the Hinton, so that the latter, as would be expected, reveals a greater number of cases.

Case 1 A woman of 23 was put under treatment because of a positive Hinton reaction with a negative Wassermann reaction, found routinely. The husband's tests were negative, and the patient became increasingly depressed, worrying lest he were silently accusing her. It was at this point that I first saw her. The patient's head was well shaped and her shins were sharp, but although her teeth were apparently in good condition, minute examination showed that all four 6-year molars contained many fillings. The left upper central incisor had been jacket-crowned because it was stunted and slightly notched and did not match the others. A slight deafness was noticeable, this an aurist had diagnosed as "nerve deafness, probably syphilitic." The patient was the last of eight children, all living and well, she said that there had been no miscarriages or infant deaths and that her mother was well, but that her father had died of a "nervous breakdown." Further questioning led the patient to request a true account from her mother, when she learned that the father had died of general paresis in a state hospital. She learned also that between herself and the next older sibling there was an interval of 7 years during which the mother had three miscarriages, which she had concealed because she had known syphilis to be the cause. Neither parent had received treatment except for brief treatment of the father just before his death. These facts established a diagnosis of congenital syphilis beyond doubt, and as a result the patient's emotional attitude completely changed. Despite her age she is now being cautiously treated, since she thinks that her deafness has increased a little in the past year.

Case 2 A lawyer became aware of the similarity between the treatment for syphilis given to a client's child and that given 16 years previously to his own infant son. He immediately sought medical advice. No clinical evi-

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dence of syphilis was found in him, his wife or his son, Wassermann tests were consistently negative, but Hinton tests of the wife and son were repeatedly positive. While it would be impossible to make a watertight diagnosis of congenital syphilis, the acquired form of the disease in a boy of high school age should show a positive Wassermann reaction as well as a positive Hinton. Moreover, the knowledge that his mother has syphilis decidedly strengthens the argument for the congenital form.

Case 3 A man of 25 was referred for an opinion as to the safety of marriage. He gave a history of a chancre 5 years before, which appeared 4 or 5 days after a single exposure. No dark field examination had been made but on the evidence of a positive Wassermann reaction during the first few days of the lesion, the patient had been given an intensive course of treatment for 4 years without a physical examination at any time. His Wassermann reaction became negative after the treatment, but because the Hinton reaction remained positive the physician, failing to take an up-to-date view of the situation forbade marriage. While the Hinton reaction usually becomes positive very early in the primary stage of syphilis a positive Wassermann reaction has long been known to be considerably delayed. Furthermore, in this case the circumstances should have aroused suspicion of pre-existing syphilis rather than of a recent infection.

The patient was an orphan and knew nothing of his parents, or even of the existence of brothers or sisters. Examination of the teeth showed the upper central incisors to be stunted and slightly but definitely notched, the laterals were stunted but not notched, the lower incisors were set widely apart and tended toward an oval shape in cross section, instead of being normally wide and thin. Both corneas were slightly hazy, and the shins were definitely bowed anteriorly and roughened. All these signs pointed to an unmistakable diagnosis of congenital syphilis.

Considering the time that had elapsed since the patient's infection and the amount of treatment he had received he should have been permitted to marry even with acquired syphilis. Upon being told that he had congenital syphilis, which is probably never dangerous to the mate or the offspring, he married with much more confidence, and felt much easier about having stopped treatment while the Hinton test was still positive. As congenital syphilitic patients rarely have lesions after the age of 18 or 20, it is reasonable to suppose that his treatment was largely useless, and that a small amount of much less exacting and less expensive treatment would have been better. The original lesion, by the way, was undoubtedly a herpes progenitalis, for he later showed one which he said was exactly like it.

Case 4 An Italian girl of 18, wishing to marry and have children, asked for a physical examination to determine her fitness. She showed nothing of interest except a positive Hinton and a negative Wassermann reaction. There was little or no doubt of her virginity. The history disclosed that her father came to this country alone, leaving his bride in Italy until he could afford to send for her. Subsequently three children were born, with no other pregnancies, the mother was still living and well. The father had died in an accident.

In trying to ascertain whether the patient had acquired or congenital syphilis, we examined the other siblings and found their reactions negative. The mother, however, had positive Hinton and Wassermann tests, and finally acknowledged that her husband had been very promiscuous while alone in this country. As the girl was still

within the ages between which congenital syphilitic lesions may occur, she was put on oral mercury alternated with intramuscular bismuth and fairly long rest periods. So far as a possible husband or children are concerned, there is of course no danger of infection.

Case 5 An unmarried colored girl of 14 had previously received a diagnosis of acquired syphilis on the strength of two positive Hinton reactions and a pregnancy. The Wassermann reaction was twice negative, which made it very doubtful that in a girl so young the infection was acquired, especially since her baby did not have congenital syphilis. Examination of the teeth revealed 6-year molars strongly suggestive of the mulberry type, and all incisors, upper and lower, slightly stunted and rather widely separated, though none were characteristically notched. There was also poor development of the upper alveolar process, so that the incisor teeth could not be made to meet at their cutting edges in any position of the jaw. With this evidence there was no doubt that this was a case of congenital syphilis.

Case 6 A vigorous-looking man of 26, about to undergo an extensive nasal operation, was found to have positive Hinton and negative Wassermann reactions. The operation was delayed pending an opinion as to whether treatment should be given, and if so how much, before the operation could be safely performed. Study of the patient's teeth showed four lower incisors widely spaced and almost oval in cross section, with cutting edges rather frayed out but not definitely notched. The four upper incisors were artificial, having been supplied when the patient was very young because his own incisors were frail and decayed. All the 6-year molars had been removed while he was still in grammar school. No history suggestive of gonorrhea or syphilis could be obtained. There was no evidence of any scar from a primary lesion or of adenopathy, yet there were no other physical signs pointing to congenital syphilis. The family history disclosed that the mother had had three or four miscarriages in the course of producing five children. After the miscarriages only two children were born—the patient and another boy, his senior. The latter was being cared for at the Perkins Institute for the Blind, where his illness had been diagnosed as interstitial keratitis and congenital syphilis. This evidence was sufficient to substantiate a diagnosis of congenital syphilis, and established a contraindication to treatment, because of his age.

Case 7 A woman of 62 was found to have positive Hinton and negative Wassermann reactions. The diagnosis of syphilis had been made at another institution. The patient had been led to believe that she was in a dangerously infectious condition, and came to us in a frenzy of fear for herself and for her family. It was possible at her first visit to reassure her completely, and to tell her that her case was probably one of congenital syphilis. We were brought to this conclusion by the condition of her lower incisors, which were shaped almost like matchsticks. Corroborative evidence was eventually found, in that her husband and eight grown children showed no evidence whatever of syphilis. There had been several infant tragedies among her siblings. Her father had died in an insane asylum in Austria. She did not know the diagnosis but remembered that for some months he thought he was a king or an emperor, a condition that suggests general paresis. Her physical examination was perfectly normal.

Case 8 A woman was tested on applying for a position as a nursemaid. The blood Hinton test was positive and the Wassermann test negative. On repetition the Hinton

test was positive, and the woman was refused the position before being referred to me for an opinion. Her father had died in an accident. Her mother had confessed on her deathbed that she had been very promiscuous and had got herself into "very much trouble," but the patient was too young at the time to grasp the significance of the confession. The first child was said to have had perfect eyesight and perfect teeth, and a blood Hinton test was said to have been negative. The second child lived a few weeks and then died of "measles." Our patient was the third child. She had never been well, and when she was 11 years old had serious eye trouble, as a result of which she now showed scarred corneas. She had moderately typical Hutchinsonian upper central incisors, and one perfectly typical 6-year molar of the mulberry type. The other three 6-year molars were removed early in life because of bad decay. She had been slightly deaf since grammar school days. It was unfortunate that these evidences of congenital syphilis were not observed until after the patient had been refused the position as nursemaid, since she had been no possible danger to anyone for many years.

Case 9 A routine blood test on a woman of 58 was reported negative by the Wassermann technic, positive by the Hinton. As her husband and six children gave no evidence of syphilis by history, examination or blood test, it was an easy matter to prove that her case was congenital. While in high school she had had eye trouble,

which from her accurate description after the lapse of many years was almost indubitably some form of keratitis. Her lower incisor teeth were nearly square in cross section and did not quite touch the upper ones in any position of the jaw. The upper teeth had been replaced by a denture. Just to the left of the mid line there was a small hole through the soft palate, doubtless due to a gumma, and known to have appeared when she was a child.

CONCLUSION

Hospital and private records show many such instances illustrating the advantage of the blood Hinton test in disclosing obscure cases of congenital syphilis. In adult cases the Wassermann reaction is sometimes positive, but much more commonly it has by this time become negative. It has been shown how many more cases can be detected by the Hinton test than by the Wassermann test. The question as to whether the Hinton test ever becomes spontaneously negative in these cases merits further study, but from our present knowledge it appears that this seldom occurs.

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REFERENCE

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THE HINTON TEST

VI Syphilis Acquired in Childhood

AUSTIN W CHEEVER, M.D.*

BOSTON

IN an attempt to find out just what was meant by a positive Hinton test accompanied by a negative Wassermann test, we made an especially painstaking study of some cases of this type at the Massachusetts General Hospital. One of the most interesting groups, though not a large one, comprised those who as children had accidentally acquired syphilis.

In the days of promiscuous wet-nursing, infantile infections were well known. Before antiseptics and asepsis, the ritual of circumcision was not uncommonly followed by accidental syphilis, as was smallpox vaccination when the much-prized "scab" from a previous patient was used. Syphilis is accidentally acquired in childhood more frequently than is usually believed, and our ability to trace and explain such infections when the patient has reached adult life often greatly reduces his or her heartache and at times prevents family complications.

CASE REPORTS

Case 1 A routine blood test on a man of 24 showed a positive Hinton and a negative Wassermann reaction.

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Both history and physical examination were without interest except for the repeatedly positive Hinton reactions. Nothing suggestive of congenital syphilis was found. Later the patient said he vaguely recalled having had some intravenous injections when he was about 8 years old. It was some months, however, before he learned from his mother that he had had a primary tonsillar lesion at that age and had received what was then considered adequate treatment.

Case 2 A married woman of 25 showed a positive Hinton reaction on a routine examination, and an absolutely negative family history. She had never been pregnant. In attempting to date the infection we asked permission to make a study of the husband, whose health was excellent. His physical examination and blood test were negative and threw no light on the problem. It was not until a few weeks later that an aunt of the patient told her that because of a primary lesion many years ago on the lower lip she had been given mercury for 3 or 4 years when of primary school age. On careful examination the scar was found, faint as such scars are on the vermilion edge, but easily defined when the lip was stretched.

Case 3 A high school girl needing tonsillectomy had a routine test which showed a positive Hinton and a negative Wassermann reaction. Here no effort had to be expended to find the facts, for the patient knew that she had had a primary lip lesion several years before. She had had regular negative Wassermann tests since that

time. However, the greater sensitivity of the Hinton had detected the infection.

Case 4 A routine Hinton test taken as part of a medical examination on a man of 50 was found to be positive, while the Wassermann reaction was negative. No history suggestive of primary or secondary syphilis was given, though the patient freely admitted unusual promiscuity before marriage. Blood tests on the wife also were reported positive by the Hinton and negative by the Wassermann test. This discovery added considerable tension to an already strained family situation. The husband anxious not to add to this misunderstanding, requested that his wife should not be bothered with too searching an inquiry. It was not until the wife had made a number of visits that she happened to smile in just the right illumination to show a faint scar on the vermilion border of her lip. Questioning as to the cause of this scar settled the matter, for she described a large sore of the lip which occurred while she was a schoolgirl and lasted a number of weeks. It was accompanied by lumps beneath the chin and followed by a rash, which gave her no discomfort. Nothing was ever done about this condition so far as she could remember. Her husband's syphilis seems to have been independent of hers.

Case 5 A routine blood test on an Italian woman of 21 was positive by the Hinton method and negative by the Wassermann. After a little questioning, it was found that she had been a patient at the hospital when she was a child.

The old record showed that she had suffered from alopecia, condylomas, very large, hard tonsils, very large "tonsillar glands" on both sides, general slight adenopathy and a fading general rash. The falling hair had been the symptom that prompted the mother to take her to the hospital. The family history showed that several older siblings had come along in quick succession. There had then been four miscarriages, followed by the birth of a living child, who had contracted a "terrible case of measles" when she was 4 weeks old. At the time of the examination the measles of this youngest child consisted of the fading remains of a rash, large liver and spleen, snuffles, and mucous patches in the mouth and about the genitals. Our patient when not at school had undertaken much of the care of this baby, and had freely kissed her on the mouth. The entire family had received adequate treatment at that time, and their Wassermann tests had been negative for several years.

With a Hinton test showing a positive reaction, we were able to account definitely for her infection.

Case 6 A man of 76, born in Vienna, was found on routine examination to have a positive Hinton reaction and a negative Wassermann. He had absent knee jerks

and Argyll Robertson pupils, but an absolutely negative spinal fluid and no other symptoms of tabes. The patient expressed surprise that the Hinton test was positive, not appreciating its sensitivity. He said the Wassermann had been negative for over 20 years. When he was about 20 his mother told him that he had had a wet nurse infection with syphilis, and that he had undergone several years of treatment with mercury. He was not given treatment.

Cases 7 8 9 Three cases seen at the Massachusetts General Hospital led us to conjecture as to the eventual discovery of positive blood reactions without corroborative evidence. One of these cases was that of a baby who had had a primary lesion on the eyelid. The second was that of her sister, a year older, who had had a primary lesion of the upper lip. No source was ever found and there was no other case of syphilis in the very large family. The third case was that of a little boy with a large primary lesion on the chin, contracted from his aunt while she was caring for him during his mother's second pregnancy.

CONCLUSIONS

Though such cases as those mentioned above do not occur frequently, they should not be forgotten when an obscure syphilitic infection must be accounted for, since it is important whenever possible to establish the innocence of the infection for the sake of the patient's emotional balance and the better understanding of the situation by the present or a future mate. It is also important from the point of view of the planning for children, for it is a well-established fact that the longer the interval between infection and pregnancy, the less chance there is of a damaged fetus.

From the point of view of treatment, it is very important to date the infection, because syphilis which is of recent origin needs attention when discovered in a person from twenty to forty years old. If, however, it can be determined that the infection occurred in childhood, thus antedating the usual age of infection in acquired syphilis by from ten to twenty years, such young people need less intensive treatment. In some instances, indeed, they need none at all, depending on the physical findings, the age of the patient and the duration of the disease. For it is gradually becoming more generally realized that it is the patient and not simply the blood test that needs treatment.

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the level of the tibial tuberosity down to within 5 cm. of the lower end of the bone. It gave the appearance of a cystic tumor or a series of cystic masses of varying sizes joined together throughout the medullary canal. The cortex varied in appearance from a marked rarefaction, and in places almost complete erosion, to dense thickening and proliferation, indicating a prolonged destructive process combined with a reparative one. The middle

outward of the cortex before the tumor finally broke through.

However, when further consideration was given to the history of a visible, palpable tumor of over 4 years duration, and when a complete physical examination failed to reveal any physical sign of any extension, either direct or metastatic, and when further x ray studies of the femora, pelvis, spine, lungs and cranium failed to show any involvement, the diagnosis of malignant tumor seemed questionable.

What bone tumor could give this extensive local involvement over a period of 4 years with no signs of involvement anywhere else? At a loss to explain these findings, we felt that a biopsy aspiration was warranted in order to justify the diagnosis of bone tumor and to establish its type. This was performed 5 days later under light nitrous-oxide anesthesia. The needle was introduced through the dome of the tumor and encountered considerable resistance, as if going through a soft, spongy,



Figure 1 General appearance of the tumor in the middle and upper thirds of left leg when the patient first presented himself for advice. Note the slight discoloration on the lower or inner aspect with tortuosity of veins over the surface of the tumor.

section seemed to be the point of greatest involvement. The lateral views illustrated more clearly the extensive involvement and changes noted in the anteroposterior view, showing a complete erosion of the cortex in practically the entire length of the upper third of the tibia, and sharply demarcating the borders of the visual tumor involving the soft parts.

Clinically and roentgenologically there immediately presented itself a differential diagnosis of a soft tissue tumor involving the bone, a medullary bone tumor of osteogenic origin arising from within and extending outward, and a tumor of periosteal origin invading, secondarily, the medullary canal. The first possibility was dismissed as entirely unlikely. The third was temporarily accepted as the more plausible, primarily because of the x ray finding on the lateral view that so much of the cortex was eroded and direct extension from this point seemed to occur. It seemed also that if the tumor had arisen primarily from within the canal, there would have been considerable, gradual widening and bowing



Figure 2. Lateral view of the leg showing the lateral involvement and the elevation of the tumor mass from the tibia.

bony substance before entering the softer portion of the mass. After withdrawal of the needle, there was profuse bleeding for a few minutes at the point of insertion.

Dr Louis P Hastings, to whom the material was submitted, reported the specimen on November 21, 1935, as follows:

"Specimen consists of about 10 cc. partially coagulated blood, scattered with minute fragments of tissue, none over 1 mm. in diameter. Fragments collected, embedded in fibrin and sectioned. Sections reveal two types of tissue, namely islands of fibroblastic proliferation with giant

PRIMARY ADAMANTINOMA OF THE TIBIA

RICHARD E. DUNNE, M.D.*

HARTFORD, CONNECTICUT

ADAMANTINOMA, a tumor of enamel origin, while not frequent, is by no means a rarity, and is frequently discussed in the literature. The tumor arises as an aberrant growth of epithelial cells, which are the prototypes of those forming the inner layer of enamel origin, the so-called ameloblasts. Tumors of this type, because of their location, are almost synonymous with tumors of the jaw, their occurrence elsewhere is extremely rare, and in fact only 6 cases could be found in the literature. Of these, the tumor in the one reported by Thoma¹ occurred in the ovary. The others were all in the tibia, so that the case reported in this paper is the sixth of primary adamantinoma of the tibia on record. Because of the rarity of this disease, and the very great extent of this particular tumor, the case was thought to be worth reporting in detail. It is of interest also because it is the only one treated by x-ray, and its very evident failure to respond to preliminary radiation is noteworthy.

The first case was reported by Fischer² in 1913 and was that of a man of thirty-seven who slipped and fell on a chair, a tumor appearing five months later. Nine months later the tumor area was resected, and on this specimen the diagnosis was made. The second case was reported eighteen years later by Baker and Hawksley.³ The patient was a man of forty-six who injured his lower leg with an iron bar, with subsequent appearance of a tumor. Ten months later a subperiosteal resection was performed, and the diagnosis was substantiated by histologic examination.

Ryrie⁴ reported a case with a history quite similar to that of the previous cases, differing, as he points out, only in the long latent period. The patient, a man of thirty-six, was kicked in the shin, and eight years later a tumor appeared on the same site. Pain and tenderness had persisted most of the intervening time. Fearing that the tumor was a sarcoma, the surgeon advised amputation, but the patient refused operation. Eight years later, or sixteen years from the time of injury, the patient again presented himself for treatment. At this time resection was performed and the diagnosis was established from the histologic structure of the removed tissue. Six months later an amputation had to be resorted to because of recurrence. A fourth case was reported in 1934 by Holden and

Gray.⁵ The fifth case, reported by Bishop⁶ in June, 1937, was that of a man of twenty-two who sustained a fracture below the knee. A tumor was found at the site of fracture one month later, two months later the bone was opened, the tumor was resected, and bone grafts were inserted. Amputation was performed two months later because of recurrence, and histologic examination proved the tumor to be an adamantinoma.

CASE REPORT

J. D., aged 32, presented himself on November 18, 1933, complaining of a large swelling at the junction of the middle and upper thirds of the left leg, of approximately 4 years' duration.

He stated that in April, 1931, he fell over an iron tool box, scraping his left shin and producing an extensive, painful abrasion and contusion of the upper half of the left leg. He was given first aid and subsequent dressings for several weeks by an attendant in the plant. It eventually healed and caused him no further discomfort. Six months later, however, he sprained his ankle in the same plant, rather severely. A fracture was suspected and the ankle was x-rayed. This time he was seen by a physician, who told him that he had no fracture, but asked him what had previously happened to his leg. The physician was informed of the earlier accident, but made no further comment.

Several months later, having changed his employment, the patient noticed a small, painless lump on his left shin, to which he paid but very little attention as it caused no trouble of any kind. During the course of the next 4 years it grew steadily but slowly, until it finally reached the size of a small orange. The patient received no medical advice or treatment during this period, and steadily played golf and baseball.

The patient sought advice in November, 1935, because his family insisted on his so doing, and because the swelling was beginning to cause pain on walking.

Examination revealed a smooth, firm, elliptical tumor covered with normal appearing skin, at the junction of the upper and middle thirds of the left leg. The superficial blood vessels over the surface of the tumor were enlarged and somewhat tortuous. A slight purplish discoloration about the size of a quarter dollar, shading off into normal appearing skin, was present in the upper inner aspect, making the skin look congested. Local temperature was not increased. The whole tumor felt firm, with a deep sense of slight fluctuation to the whole mass, and a vague feeling of bony fragments of varying size embedded in the substance. The tumor mass measured 11 cm. from its superior to its inferior border and 7 cm. in its lateral diameter, it protruded forward from the margin of the tibia about 5 cm. at its greatest height, being roughly dome shaped (Fig. 1 and 2).

An x-ray photograph (Fig. 3) taken in November, 1933, showed on anteroposterior view the entire medullary canal of the left tibia to be involved with a tumor mass from

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greater absorption and erosion of the cortex over the main tumor mass. Many of the cystic areas in the medulla had coalesced to form one large cystic mass, and the discrete cystic areas lower down in the medullary canal had become larger. In the lower third, on the lateral view the cystic areas had again eroded through the cortex.

Clinically, pain, which had been absent, had begun to appear on walking. It had steadily increased for the previous month, and very recently there had appeared a dull, throbbing pain even at rest.

Because of a very definite increase in the size of the tumor, the increasing pain, the apparently increasing destruction of normal bone, and the fear of impending spontaneous fracture, this patient finally consented to amputa-

tion. Together with the fact that all the patients were men, who are more prone to trauma of the long bones than are women, gives some support to those who believe that trauma is a factor in tumor formation.

May one not hazard a speculation? Since trauma supplies the actuating influence for repair of an injury, if the repair processes in the individual are normal, normal repair will ensue. But if an individual is afflicted with an abnormal repair process of a biochemical intracellular nature, or if an abnormal geographic distribution of cellular material happens to be present, an abnormal repair process



Figure 5. Low power photomicrograph. Note the cystic spaces surrounded by small-cell proliferation.

tion. It was performed above the knee, rather than below, because of the evident likelihood of a recurrence in the stump due to invasion of the upper end of the tibia. The pathological report after amputation, dated September 14, 1936, was as follows:

"Sections reveal a scanty, branching, connective tissue stroma supporting a cellular tumor proliferation. The latter consists of cystic spaces lined with low cylindrical epithelium, surrounded by proliferations of small oval and stellate cells. These are deeply stained and closely packed, and resemble epithelial cells of the basal type. The histologic structure is that of a typical adamantinoma. Diagnosis: adamantinoma of the tibia. (See Fig 5, 6, 7)"

The patient had an uneventful convalescence the first week. He has now been back at his business as an insurance executive for about a year. There is no sign of local recurrence in the stump, and the patient is in excellent health.

This case presents many identical features with those mentioned above. All the patients were men, ranging in age from eighteen to forty-six. There was in every case a distinct history of trauma, which had been definitely connected with the site of the tumor and its subsequent development. This, to-

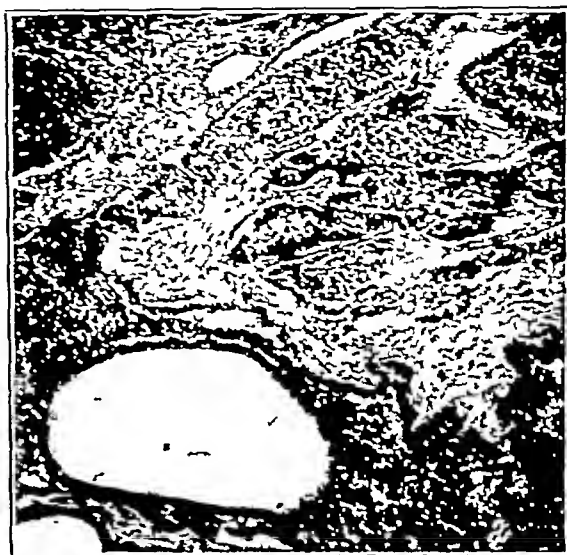


Figure 6. High power photomicrograph. Cystic space lined by low-columnar epithelium surrounded by small-basal-cell-type tissue.

may ensue—in the shape of tumor formation. If trauma did not occur, neither a normal nor an abnormal repair process would be called into being, and the status quo would be retained, but when trauma does occur, some form of repair process must be set in motion.

Granted, however, that there exists an interrelation between trauma and tumor formation, we still have not explained the factors causing an abnormal repair process to develop into a highly differentiated tumor, as an adamantinoma for instance rather than an adenocarcinoma.

Fischer accepted the fetal-cell theory in discussing a possible etiology for his case. He considered that in fetal life the whole surface epithelium had multiple potentialities, including that of tooth-germ formation. This potentiality, however, became lost in early fetal life after differentiation into the more mature type of pavement epithelium. In other words, the potentiality of tooth-germ formation was limited to that period of fetal life during which

cells of the epulis type, and small fragments composed of closely packed, small, oval, deeply staining cells. The latter are uniform and without anaplasia. The former

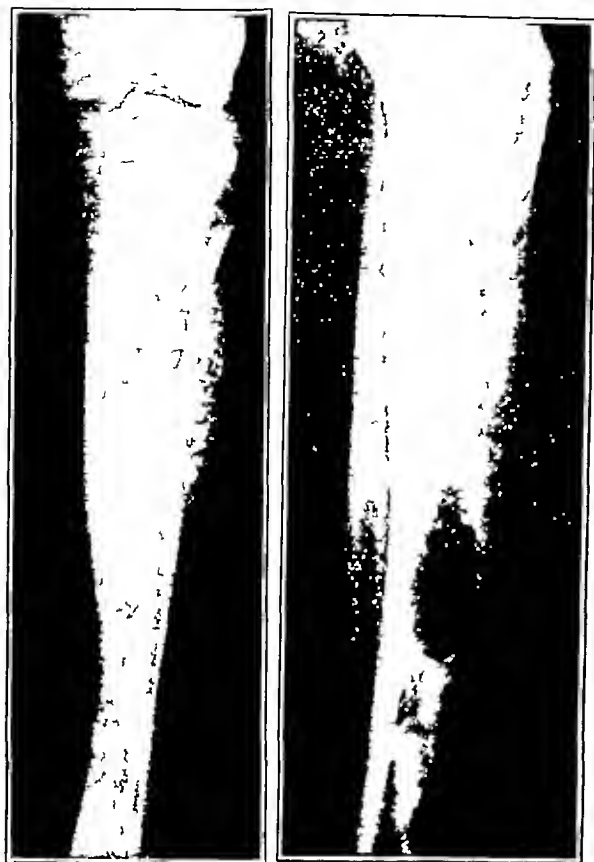


Figure 3 X-ray films taken at the first examination. Anteroposterior and lateral views showing the extent of bone destruction and the attempt at bone repair.

is considered a reactive tissue common to many bone tumors, the latter is true cellular tumor tissue, but of unusual type.

'Conclusion not osteogenic sarcoma. Suggest that this unusual tumor be referred to Dr. Fred W. Stewart for study.

The specimen was forwarded for an opinion to Dr. Stewart, of the Memorial Hospital, New York City, to whom we are greatly indebted for his interest and valuable aid. Dr. Stewart reported this specimen as one of tibial adamantinoma.

Once the diagnosis was established, the question of the correct treatment presented itself. Local resection was considered. By its very nature this type of tumor lends itself to such treatment, but it was suspected that the involvement in this case was too extensive to be feasible, as practically the entire shaft, cortex and medullary canal would have to be removed, necessitating extensive bone grafts from the other tibia. Resections are possible, but are doomed to failure unless complete removal can be obtained. This left either radiation or amputation. As these tumors are exceedingly rare, no precedents exist to guide one in treating them by radiation. The only reported benefits in the radiation of jaw adamantinomas seem to have resulted from treating them lightly over a long period. This patient helped us in our decision by refusing amputation.

Consequently, deep x-ray therapy was instituted, with the following technique. One port anteriorly and one port posteriorly were used over the tumor, using 75 r per day, alternating front and back, eventually giving thirty treatments per port. These treatments, as specified, were carried on by Dr. William H. Van Strander, who reported that the patient's skin was able to stand the continued application. The treatments were instituted in January, 1936, and in March, 1936, further x-ray views were taken for comparison. No change was noted from those taken before treatment was instituted. There was no apparent regression in the tumor itself, no sign of bone hyperplasia and no increase of the tumor mass. Clinically, the tumor appeared slightly larger and a little more tense.

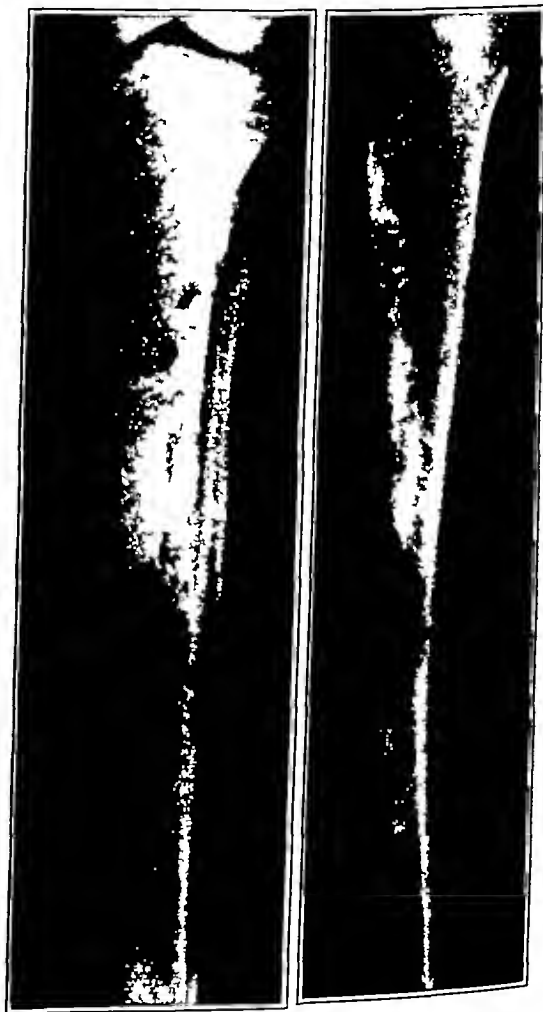


Figure 4 X-ray films taken three months after the completion of radiation therapy. Note the progression of the tumor.

Realizing, however, that the maximum effect from radiation could hardly be expected so soon after the completion of the course of treatment, amputation was delayed further, in hope that we might be able to observe favorable changes through x-ray films taken at frequent intervals.

Films were taken at monthly intervals, and a gradual progression was noted in the tumor with further erosion of the cortex. Films (Fig. 4) taken in June showed

have been achieved through prolonged exposures to light dosage.

The results are not comparable with those of resection, which is the treatment of choice, and should be resorted to when the tumor is first seen, provided that the involvement is not so great as to challenge its feasibility. Much grief can be saved in not attempting resection of the tumor if the involvement obviously is quite extensive. The extent is not always apparent. In 2 of the cases reported, amputation was subsequently resorted to because of failure to resect the tumor completely.

It is easy to overlook cell pockets. Amputation should provide a complete and lasting cure.

50 Farmington Avenue.

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PRACTICAL PHYSICAL MEDICINE FOR CHRONIC ARTHRITIS

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BOSTON

NO THERAPY has been shown to be more consistently effective in the treatment of chronic arthritis than is physical medicine. This includes the use of heat, light, massage, exercise, hydrotherapy, electricity and occupational therapy. As various efforts to introduce a specific treatment for chronic arthritis fail, physical therapy continues to enjoy increasing favor. On the other hand attempts to apply physical medicine, with its ever-widening scope, to this disease have led to the introduction of bizarre methods of treatment, particularly in the field of electricity. It is my purpose to discuss the more fundamental aspects of physical medicine, especially with reference to their practical application to the arthritic patient.

REST AND EXERCISE

Any treatment undertaken to aid the patient with chronic arthritis will lose its effectiveness if it is not fully appreciated that these individuals are suffering from chronic physical or mental fatigue, and very likely both. Until sufficient rest has been enjoyed, treatment of whatever form is handicapped. Writing on rheumatoid arthritis, which is the form of the disease with which we are here chiefly concerned, Cecil¹ says "If these patients in the early stages of rheumatoid arthritis could be persuaded to give up work and take a rest cure for six months or a year, a much higher percentage of them would make a complete and permanent recovery." Since for most people this is impossible, it is suggested that certain definite periods be set aside each day for rest. A suitable routine requires one hour in the prone position after each meal.²

Two positions may be taken during this hour: his back in hyperextension, a pillow under the head. For the first thirty minutes the patient lies on lower back and the knees, but none under the head, the arms outstretched, and the hands raised to the head, for the purpose of encouraging better use of the diaphragm, increasing vital capacity and obtaining a freer abdominal circulation. For the second thirty minutes he turns face down, supported by a pillow placed crosswise under the abdomen. This position not only reverses the gravitational effects upon the circulation, but counteracts the tendency of the abdominal viscera to sag. Pemberton enjoins us to consider rest "not only in the limited sense which the word connotes, to the laity and the profession alike, but in that more specific sense which regards the prone position as an instrument for achieving changes in the topographical, structural, and dynamic relations within the human body."³

Rest for the involved joints is essential. Plaster splints appear to be an effective means of accomplishing this purpose. They may be used for the prevention as well as for the correction of deformities. The close relation between the orthopedic field and physical medicine in this regard is suggested by Krusen,⁴ who declares "Prevention of deformities by proper splinting is an extremely important phase of home treatment."

The importance of exercise, within the limits of the individual patient, is seldom sufficiently emphasized. Arthritics must work to overcome the tendency to develop flexion deformities. Lying, sitting, standing and walking exercises, together with those for special joint and muscle groups, are available. No matter what the degree of arthritis, the patient will find it possible to carry

*Read before the New England Society of Physical Medicine, Boston, December 1st 1935.
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the tooth germs were forming, and any tumor showing adamantinomatous structure could not result from epithelial transplants of the adult or permanent epithelium, but must arise from groups of cells which had accidentally become isolated before the tooth-germ potentiality became lost.

Ryrie, while disagreeing with the fetal-cell theory, makes the interesting observation that a peculiar anatomic relation exists between the bone and the skin and subcutaneous tissue over the tibia along its shaft. The skin and subcutaneous tissue are

but they are malignant only locally and do not metastasize. In this series the tumors are known to have existed from a period of eight months, in Bishop's case, to one of sixteen years, in Ryrie's, yet all the tumors remained local in nature and yielded to either local resection or amputation. The case herein reported existed for over four years.

The differential diagnosis of this tumor is difficult to make clinically or by x-ray. As seen by x-ray, it may resemble a cystic tumor or any osteogenic or periosteal invasive tumor. The duration

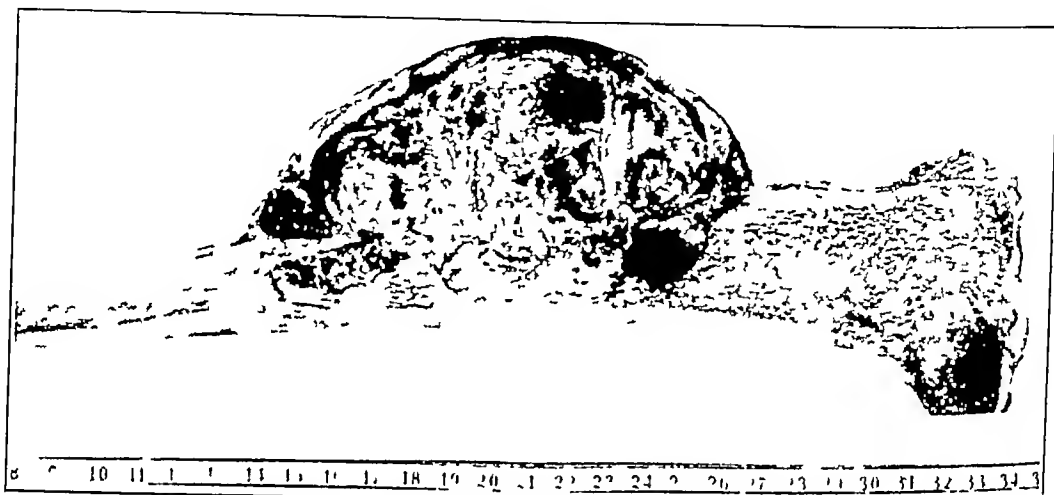


Figure 7 Sagittal section of the specimen removed by amputation. The true extent of the main tumor mass can be appreciated and we can realize how difficult would have been a resection of the entire tumor. Note the tre-

mendous thickening of the cortex in all directions away from the main tumor mass. The thickened cortex contained many isolated islands of tumor tissue.

freely movable over the bone in the lateral direction, and practically fixed in the long axis, so that relatively slight trauma of the scraping and shaving variety can produce severe lacerations of the subcutaneous tissue, out of proportion to the obvious, superficial injury. A tearing away of the anchorage of the tissue to the periosteum, with damage to the periosteum and production of hematoma, may entail a long period of healing, repair and ossification, the latter process may well result in an epithelial tumor growth if some of the deeper skin appendages, such as hair follicles, become involved in the prolonged repair processes which are common in this area.

If this were so, and an adamantinoma were to result, it would argue that the potentiality of tooth-germ formation might not be entirely lost in the higher forms of pavement epithelium.

In reviewing these 6 cases, it becomes quite apparent that the tumors are slow-growing. That they are epithelial and malignant is established,

of the tumor may be of great significance, biopsy aspiration, as used in this case, may prove invaluable, but it presents some difficulties if characteristic material is not obtained. It is, however, an excellent scientific method of establishing a correct histologic diagnosis of a tumor without destroying the anatomic relations between it and the surrounding structures. A possible spread of the tumor is prevented, and its actual nature is determined before any treatment is instituted.

The treatment can be briefly stated as a choice between resection, amputation and radiation. Radiation is placed last, chiefly because so little is known about fractionating the dosage or determining its duration and strength for this particular tumor in this particular location. To the best of my knowledge, it has been used only in this case of primary adamantinoma of the tibia. The result, so far as could be observed, was disappointing. It has been used in the treatment of adamantinomas of the jaw with some success, and its best results

respect to its use, for relatively few physicians have either the knowledge or the experience to apply it wisely and effectively. Until more agreement can be found among authorities in this field, electrical apparatus should be employed for arthritis only by those who specialize in this branch of therapy.

My own experience has convinced me that the simpler and more practical forms of physical medicine can achieve for the arthritic patient all that can be expected from complicated electrical apparatus. Not long ago I was studying a group of patients who were receiving mecholyl iontophoresis. Some of them who had experienced underwater therapy in the Hubbard tank thought that the prosaic warm-water treatments had accomplished considerably more for them than did the more spectacular iontophoresis.

* * *

I believe that the type of therapy carried out for the treatment of arthritic patients at the Robert B. Brigham Hospital certainly equals, if it does

not excel, any established routine that I have observed in this country or in Europe. The significant factor in this therapy, it seems to me, is its simplicity. Every effort is made to utilize those elements of physical medicine which are practical as well as fundamental, the aim being to elevate and restore so far as possible the normal physiologic processes of the body.

386 Commonwealth Avenue.

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out some exercises which will enable him to improve his joint function and to maintain or increase the strength of his muscles. Overhead traction, with the use of elastic leg loops, is a simple and valuable method of encouraging exercise for the lower extremities, and may be employed at home as easily as in the hospital.

HEAT

The application of heat in one form or another to patients suffering from chronic rheumatism has come down to us from ancient times, when natural thermal baths were used for this purpose. Poynton and Schlesinger⁵ state: "The principle underlying the treatment of all chronic rheumatic conditions is the same, namely, to soften[relax] the tissues by heat, and to follow this by massage and movement." The problem of supplying the heat to the joints locally is, I believe, best met by the application of hot-water fomentations. Wool is the best material to use. After being wrung out in hot water and applied to the joint, it should be covered with a large, dry towel or blanket to prevent the escape of heat. Properly employed, the application of heat once or twice a day, even to an acute joint, gives excellent results.

The effect of warm water is that of relaxation and sedation. Simple contrast baths with hot and cold water alternated are valuable as circulatory stimulants. A therapeutic pool, such as the Hubbard tank, makes possible a restoration of movement and encourages re-education of lost function. Currence,⁶ who has carefully studied underwater therapy in arthritis, outlines a method for home use consisting of two or three tub baths a week for from three to six weeks, the temperature of the water being raised from 98 to 106°F in about ten minutes. This higher level is maintained for from five to fifteen minutes. When a woolen blanket pack has been in place for two hours, the average rise in temperature is to 101.2°F. There is an increase in the leukocyte count, which averages 2600, and the metabolism and general circulation are stimulated.

The value of baths for the treatment of chronic arthritis has been proved. Their employment for therapeutic purposes in the United States is slight as compared with that in Europe. The workers there are far ahead of us in this regard, largely owing to the great number of natural mineral springs and spas scattered throughout the Continent. While we are not convinced that the amount of any particular mineral in certain waters warrants the claims made by the proprietors of various spas, it is reasonable to assume that all such resorts contribute definitely to the welfare of the arthritic.

An effective form in which to use heat is melted paraffin. It is tolerated at a temperature considerably higher than is water. The application of wax gloves may be done routinely by the patient in his home, and with a clean paintbrush the wax may be readily applied to any area. According to Krusen,⁷ it is of real value in the treatment of back pain.

Fever therapy has been used in the treatment of at least forty different diseases, and numerous papers on the subject have appeared in the past two years. The best results have been achieved in gonorrhea, chronic as well as acute. With respect to arthritis, fever therapy has proved to be almost specific for the early case of gonorrheal origin, but in chronic rheumatoid and osteoarthritis it is of doubtful value.

MASSAGE

Massage continues to hold high rank among the measures of physical medicine available to the chronic arthritic. So far as this disease is concerned, it is well to recall that the underlying principle in its application, according to Pemberton and Osgood,⁸ is aimed to achieve a betterment of blood flow and other physiologic processes, yet never to increase trauma, sensitiveness or other abnormalities which already exist.

It is probable that more arthritics benefit from massage in combination with heat than from any other form of treatment. At the same time, the promiscuous ordering of "baking and massage," so commonly seen in outpatient practice for arthritics who have withstood, as Copeman⁹ says, "the onslaughts of potassium iodide or the salicylates with out improvement," is hardly to be considered proper medical treatment. There is a definite need for physicians who treat arthritis—and that means most of us—to learn and to practice the fundamental principles of massage.

Long, smooth strokes should be used in a direction toward the heart. Gentleness is of prime importance, especially in the presence of pain. The massage should be preceded or accompanied by the application of heat. Poynton and Schlesinger⁵ have written: "There are few vocations in which technic is of more value than massage. More harm than good can be done if it is entrusted to incompetent hands."

ELECTRICITY

The possibilities for the therapeutic use of electricity are legion. That this modality is popular both with the profession and with the laity is attested by the extensive and varied equipment of this character which is used in physical medicine today. Yet it seems desirable, notwithstanding its popularity, to take a conservative position with

jaundiced. Just a few days before entry she had had diarrhea and for the past two days her bowels had not moved.

Physical examination disclosed a distended abdomen without spasm but with moderate tenderness—a picture quite consistent with the presence of a mechanical obstruction, but not suggestive of a paralytic ileus due to any widespread inflammatory process. There was some dullness in the flanks which may have been due to fluid. Pelvic and rectal examinations were negative. The fact that no mass was palpable in the abdomen and the fact that no mass could be felt on pelvic examination suggest that it could not have been a large one. An ovarian cyst six inches in diameter would ride above the true pelvis so that it could not be felt on vaginal examination, but a mass 15 cm. in diameter should easily be felt through the abdomen. I therefore conclude from the x-ray findings that the soft-tissue shadow described as lying in the posterior part of the right lower quadrant was probably a flat mass with a good lateral diameter.

The woman had a temperature of 100°F., a slight leukocytosis, a mild anemia, and a lowered serum protein, with a history of what I interpret as being fairly constant pain during the attacks. Several possibilities come to mind. She may have had attacks of appendicitis, which finally developed an abscess medial to the cecum, with adherent loops of small bowel, producing recently a definite mechanical obstruction. Another possible diagnosis is diverticulitis. The x-rays fail to mention the colon, so we do not know whether such an examination was made. The type of pain would fit in well with this diagnosis. The fact that the pain started on the left side suggests it, and moreover it is not unusual for a long loop of sigmoid to lie to the right of the midline where the soft-tissue shadow was seen in the films. On the other hand I should not expect an area of chronic diverticulitis to be visible by x-ray as a mass, unless it had perforated and formed an abscess.

I have considered the possibility of regional ileitis. The patient is rather old to have this disease, and it does not seem to me that the past history is suggestive. The x-ray finding of narrow loops of small bowel may indicate it, but I do not feel that the picture was characteristic of this disease. The narrowing in this case involved several loops of small bowel rather uniformly, and the picture did not show spasm. This woman, of course, may have had cancer, but her lack of weight loss and the fact that there are so many points to suggest an inflammatory process rather make me feel that such was not the case, despite the bleeding. The facts do not point clearly to a diagnosis, but I believe she had an inflammatory process, probably an abscess in the region of the cecum

with small bowel adherent to it, and that she was getting attacks of actual mechanical obstruction. There is, however, no reason for making a diagnosis of diverticulitis without any evidence of a colon x-ray's having been done. Judgment as to source of bleeding is impossible without the results of proctoscopic examination. The history sounds to me more like diverticulitis than anything else, and this might be put down as the most likely diagnosis, with an appendiceal abscess second. The bleeding may have been due to internal hemorrhoids, although a tumor in the bowel producing obstruction is a possibility.

I should like to see the x-ray films.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON. She was a very obese person but these films are excellent. This mass that is described was quite definite. It could be seen in both the anteroposterior and lateral views, in spite of her size. This mass was sharply defined, smooth and perfectly round, and occupied the right kidney area. It was thought to be retroperitoneal because it obliterated the outline of the psoas muscle. The right kidney outline could be seen. In the lateral view the center of the mass was nearly 5 cm. anterior to the vertebrae. The small bowel overlying the mass was ileum, and was smaller than usual, so was the right half of the colon. The motor meal, however, could not fill this portion of the bowel because of obstruction at a point in the lower jejunum. That is as far as we can go. The motor meal ended rather abruptly over the region of the left sacroiliac joint. The bowel in this area was round and smooth, but the obstruction did not have the appearance of intrinsic disease of the small bowel at this point. This is the flexure of the small bowel and the actual point of obstruction must have been in another place. At the same time it did appear to point toward the mass on the right side. Then the problem arose as to why the retroperitoneal mass would obstruct the terminal jejunum and how it could do it. Also, where was the right kidney, and since she was bleeding, was the disease primary in the small bowel?

DR. HORACE K. SOWLES. I think recurrent attacks of pain of this character are typical of carcinoma of the small bowel, but of course that is a rather uncommon disease.

PREOPERATIVE DIAGNOSES

Ovarian cyst?
Large bowel neoplasm?

DR. HAYDEN'S DIAGNOSES

Inflammatory disease in region of cecum, either from diverticulitis or appendicitis, with secondary mechanical obstruction of ileum.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24151

PRESENTATION OF CASE

A sixty-two-year-old American widow entered the hospital with the complaint of abdominal cramps and vomiting of two and a half months' duration.

For the year before entry she had occasionally noticed small amounts of bright-red blood in her stools. She was not aware of having hemorrhoids. Two and a half months before entry she began to have attacks of cramplike pain beginning in the left lower quadrant, or in both lower quadrants, and radiating upward and toward the midline. The pain was usually accompanied by abdominal distention which on occasions was very marked. She also had gaseous eructations and could obtain some relief by inducing vomiting. The attacks occurred every week or two and lasted three or four days. During the attacks the eating of food seemed to increase the distention and was accompanied by some nausea. However, it had no effect on the pain. For a short time before entry she had had attacks of severe, boring pain starting in the region of the umbilicus and going through to the back. She had no hematemesis. She had no long-standing constipation, but shortly before entry had some diarrhea, and for two days before entry her bowels had not moved and she had not passed gas by rectum. Her appetite had remained quite good and she thought that she had not lost any appreciable amount of weight. She had had no jaundice or clay-colored stools.

Her past history was otherwise essentially negative, and her family history was not contributory.

Physical examination revealed an obese woman in moderate discomfort. The heart and lungs were negative. The blood pressure was 110 systolic, 60 diastolic. The abdomen was enormously distended, moderately tender and tympanitic throughout, except in the flanks where there was dullness. There was no demonstrable fluid wave, no viscera or masses could be felt, and there was no spasm. Pelvic and rectal examinations were negative except for two large external hemorrhoidal tabs.

The temperature was 100°F, the pulse 105. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,960,000 with 70 per cent hemoglobin, and a white-cell count of 10,400

with 89 per cent polymorphonuclears. The blood Hinton test was negative. The nonprotein nitrogen of the blood was 21 mg per cent, the protein 4.7 gm. The chlorides were equivalent to 100 cc. of N/10 sodium chloride. The carbon-dioxide combining power was 66.5 vol per cent.

A gastrointestinal x-ray series showed no evidence of lesions in the esophagus, stomach or duodenum. There was marked dilatation of the upper half of the jejunum, which was filled with air and fluid. There was much delay in the passage of barium through the small intestine so that at the end of twenty-four hours there was still some present in the jejunal loops. There was a soft-tissue mass measuring 15 cm in diameter in the posterior part of the right lower abdomen. The loops of the lower part of the intestine overlying this mass appeared to be narrowed, but no definite point of obstruction was visible on the films, although it was thought to be at the edge of the mass. The mass displaced the ascending colon laterally.

A laparotomy was performed two days after entry.

DIFFERENTIAL DIAGNOSIS

DR. E. PARKER HAYDEN: The first important point in the history is the occurrence of bright red rectal bleeding at intervals for a year. The fact that the patient was not aware of having hemorrhoids means nothing, because internal hemorrhoids are not appreciable to an individual unless they appear outside the anus. This woman, therefore, may have had internal hemorrhoids which were the source of bleeding. The attacks of cramplike pain began two and a half months before entry, and their character is certainly suggestive of the presence of some type of intestinal obstruction. The pain started in the left lower quadrant, was sometimes felt in both lower quadrants, radiating upward to the midline, and was accompanied by distention on many occasions. Her vomiting, however, was induced, which suggests that the obstruction must have been low down and incomplete, or she would not have had to induce the vomiting. The attacks occurred every one or two weeks and lasted three or four days. I get an impression from the history that although she was having cramplike pain, she also had more or less constant pain which lasted several days at a time. The statement that the eating of food had no effect on the pain suggests that the pain was there most of the time. A short time before entry she had several attacks of a different type of pain, boring in character, starting at the umbilicus and radiating through to the back. This story of course remotely suggests a gallstone attack, but the location of the pain, so low down, is against it, and she had not been

ible in the small intestine. The midtransverse colon was high in position, and there were questionable adhesions in the region of the right side of the transverse colon. There was no evidence of obstruction, and no masses were visible.

A laparotomy was performed on the day of entry.

DIFFERENTIAL DIAGNOSIS

DR EDWARD L. YOUNG. When any patient comes to a physician with right lower quadrant pain a great many diagnoses must be ruled out before arriving at the final one. A recent article suggests fifty-three possibilities, but of course most of these would be ruled out very rapidly. Here we have a woman of seventy with a seven months story of abdominal pain which has shifted down to the right side. I have repeatedly stated that I believe any generalized or epigastric abdominal pain which shifts to the right lower quadrant is due to appendicitis in the vast majority of cases, so that if this original attack is correctly reported she has a lesion either in or very near the appendix and involving the peritoneum. We know that at seventy appendicitis is apt to present itself atypically, and we have to be on the alert not to miss the diagnosis unless we are dealing with an abscess.

What other possibilities must we consider? We have an "apparent mass." This suggests the possibility of a tumor of the cecum, and at her age cancer is the thing that comes to mind. We have no record of the hemoglobin and red count, but neither the story nor the examination suggests that there was the obvious anemia which is so apt to go with cancer of the cecum. The fact that she had no obstructive symptoms does not necessarily rule out cancer in this region, as our attention is generally called to it before it obstructs. An intussusception does not seem to fill the bill, although it cannot be ruled out. We would expect more vomiting and a more wave-like symptomatology, when there was spasm of the bowel in an attempt to push along the intussusception there would also be nausea and vomiting, whereas in the intermission the patient would be perfectly comfortable. We have the story of bleeding by rectum, but the rectal examination suggests only a fissure and that might account for bleeding. Ovarian cysts would seem to be ruled out by the fact that this mass is well up in the abdomen, not in the pelvis, and apparently behind the bowel. A large kidney such as the larger of two congenital cystic kidneys would seem to be out of the question because of her age and because congenital cystic kidneys almost always produce the effects of chronic nephritis, whereas she has a normal blood pressure and a normal urine.

It would seem to me that we have to make the

diagnosis which is most probable on the evidence, and that is an acute appendicitis with abscess formation. We have a story consistent with it. We have a white count which is elevated with a high percentage of polymorphonuclears. We are very sure it is not a peritonitis because after two days of peritonitis we would not be hearing normal peristalsis. Peristalsis can be present early in a peritoneal infection, but it rapidly subsides and the abdomen becomes completely silent. I do not see how I can disagree with what I assume was the hospital diagnosis, acute appendicitis with an abscess formation. I cannot rule out a cancer of the cecum, but even if it is present there is certainly sepsis as well. I do not believe that a barium enema would change the treatment even if it showed an intracecal lesion.

PREOPERATIVE DIAGNOSIS

Acute appendicitis

DR YOUNG'S DIAGNOSES

Acute appendicitis, with abscess
Cancer of the cecum, with sepsis?

ANATOMICAL DIAGNOSIS

Colloid adenocarcinoma of the cecum

PATHOLOGICAL DISCUSSION

DR BENJAMIN CASTLEMAN. The reasoning that Dr. Young has presented essentially coincides with that of the hospital staff. A right rectus laparotomy was performed soon after admission, with a preliminary diagnosis of appendicitis. What the surgeon found, however, was a large cecum containing on its posterior wall a tumor measuring about 7 by 5 cm. which was fixed in the iliac fossa by extension of the tumor through the cecal wall. There was some necrosis of the tumor, and evident superimposed infection, but no evidence of perforation. The appendix was not visible, and it was felt that it was imbedded in the tumor. Because of the marked adherence of the tumor to the posterior abdominal wall, because of the condition and age of the patient, and because there had not been any obstructive symptoms, nothing more was done. A biopsy from the tumor showed colloid adenocarcinoma. The procedure that was contemplated was a transverse ileocolostomy, but it was thought too dangerous at this time.

DR YOUNG. Even in retrospect I do not see how we can change our argument or make any different diagnosis. I certainly agree with the operator in not doing anything further in the face of obvious sepsis. He knows better than anyone else whether an attempt should be made to do a radical operation at a later date.

ANATOMICAL DIAGNOSES

Carcinoma of colon invading jejunum
 Obstruction of jejunum
 Cortical cyst of right kidney
 Peritonitis, acute localized
 Abscess of abdominal wall
 Coronary sclerosis with small, nonobstructing thrombus
 Pulmonary atelectasis
 Choledocholithiasis

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY The autopsy findings were interesting and a little difficult for us to interpret. The problem of the mass in the right side was easily solved. It was the kidney with a very large cyst in it, and had nothing whatever to do with any of the patient's symptoms. The small bowel was very obviously obstructed in the region of the lower jejunum, and when we took it out we found three apparently separate polyps projecting from the mucosa. Each of these polyps, however, showed necrosis in its core, which I believe never happens in a benign polyp. All of them appeared to penetrate the bowel wall, and all connected with a fair-sized mass, about 5 cm in diameter, which lay in the mesentery. This was directly adherent to an area in the sigmoid, which was hard, firm and very much constricted. On opening the sigmoid it became obvious that the lesion was a primary carcinoma of the sigmoid. Then the question arose as to whether there were multiple polyps in the jejunum plus a cancer in the sigmoid, or whether this was all one neoplasm. Since seeing the microscopic sections and re-examining the gross specimen, I now feel quite sure it is one tumor which started as a primary cancer of the large bowel, the sigmoid, invaded the mesentery and became adherent to the jejunum, penetrated it in three separate areas and continued to develop there in polypoid fashion. It is another case where I think if barium had been given from below first, instead of from above, they might have come nearer to making the diagnosis.

DR. JOHN D. STEWART What was done at operation?

DR. MALLORY At operation this large mesenteric mass was found adherent to both sigmoid and small bowel. It was not at all clear to the operator what it was. He believed it was tumor but had no idea where it was primary. He did an anastomosis between the two loops of small bowel in order to short-circuit the obstruction there, and then did a jejunostomy. The patient died about three days after operation with localized peritonitis and some sepsis of the abdominal wall, but she was in very bad shape at the time of operation.

CASE 24152

PRESENTATION OF CASE

A seventy-year-old, white, American woman entered the hospital with the complaint of right lower quadrant pain.

She was essentially well until seven months before entry when she had an attack of pain and tenderness in her right upper quadrant, with nausea, vomiting, fever and chills. After three days the pain shifted to the right costovertebral angle and right lower quadrant. During the next four days the symptoms entirely disappeared. Two months before entry she had a similar episode which lasted for five days. However, a dull ache in the right side of her abdomen persisted up to the time of entry. Her appetite remained normal, her bowels moved regularly, and she said she had maintained her strength without marked loss of weight. However, a few days before entry she began to lose her appetite, and the night before entry she developed a constant, severe, sharp pain in her right lower quadrant which kept her awake all night. The pain was accompanied by nausea but no vomiting and was increased by motion and cough. For the two days before entry she had not had a bowel movement. For many years she had had slight bleeding from the rectum after a bowel movement, and on two occasions after rectal examinations she had involuntarily passed a small amount of blood. She was an obese woman, and for two years her physician had given her thyroid, with a gradual weight loss of 25 lb. She had had no hematemesis, jaundice or melena, except as noted above. Her past and family histories were essentially negative.

Physical examination revealed a well-developed and nourished woman who did not appear to be very ill or to be suffering much pain. The heart and lungs were negative. The blood pressure was 140 systolic, 80 diastolic. The abdomen was slightly distended, and there were tenderness and spasm in the right lower quadrant and right flank, most marked in the center of the right lower quadrant. There was an apparent mass with bowel overlying it which seemed to occupy the entire right lower quadrant and flank. Peristalsis was normal. Pelvic examination showed tenderness in the right vault. Neither the uterus nor any masses could be made out. Rectal examination was unsatisfactory because of exquisite tenderness and spasm of the sphincter. The temperature was 102°F, the pulse 116. The respirations were 25.

The urine examination was negative. The blood showed a white-cell count of 14,000, 80 per cent polymorphonuclears. A flat abdominal x-ray film showed a moderate amount of gas in the colon without distention of the colon. No gas was vis-

the latter of legislation authorizing the free sale of concentrated ethyl alcohol

Furthermore, there is evidence that the increase in deaths is largely among the poor, and there are indications that welfare money has been used in many cases for the purchase of alcohol. The combined results of the depression and unemployment, and the too easy access to cheap concentrated alcohol, are apparently responsible for a large part of the death rate

A bill (House 1044) has been introduced in the Legislature for the purpose of regulating this abnormal situation. Since alcoholism is basically a public-health problem, so considered and treated in European countries, it becomes the duty of the medical profession to exert its efforts toward the correction of this serious fault in our legislation—a fault which has resulted, since the repeal of prohibition, in an annual increase of 100 deaths over the already high death rate from this cause in the Southern Medical Examiner District of Suffolk County alone

It is hoped that physicians will write to their senators and representatives and ask for the approval of House Bill 1044, which is now before the Committee on Legal Affairs

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 67 CENTRALLY IMPLANTED PLACENTA—BLEEDING AT TERM

Mrs S., a thirty-eight-year-old multipara, entered the hospital on October 29 in labor at full term. She was having mild pains and passing more blood than is considered normal for that stage of labor.

The family history was negative for diabetes, tuberculosis, cancer and hemorrhagic disease. Her past history was negative except for whooping cough, measles and mumps. The tonsils had been removed when a child, and the appendix a few

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years previously. Catamenia began at the age of eleven, became regular and of the twenty-eight-day variety after two years, and lasted five days without discomfort. Her last period was January 17, making the expected date of confinement October 27. There had been two full-term, normal deliveries, and no miscarriages. The prenatal period of each previous pregnancy had been uneventful except for a slight toxemia during the late third trimester. This pregnancy had been normal except for slight bleeding once during the seventh month and a rise in blood pressure to 140 systolic, 90 diastolic, during the last month, the latter was unaccompanied by albuminuria. A vaginal examination in the office at the seventh month revealed no cause for the bleeding, and very little importance was attached to the incident as it was slight and did not recur. Throughout her pregnancy her general physical condition had been good.

When the patient entered the hospital she was in excellent condition. Her temperature was 98°F, pulse, 88, respirations, 20, hemoglobin, 80 per cent. No complete blood count was done. In view of the fact that she was bleeding more than was normal, her husband was typed, and his blood found to be compatible.

Abdominal examination showed a large abdomen with the fetus in LOA position and the presenting part high and unengaged. The fetal heart sounds were easily heard below and to the left of the umbilicus. Under careful aseptic conditions, with the patient in the Trendelenburg position and under gas-oxygen anesthesia, a vaginal examination revealed a boggy vaginal vault and a vertex that could not be made to engage. No pulsation of the vessels was noted, but a small amount of fresh blood was seen coming from the cervix. A finger was carefully inserted through a soft multiparous os, this was followed immediately by a tremendous gush of blood. Before a vaginal packing, which had been held in readiness, could be inserted, the bleeding, which was terrifying in its proportions, had stained the drapes up to the patient's neck. The introduction of 7½ yd of vaginal packing controlled the bleeding to a large extent. Following the hemorrhage, the patient's pulse rose to 128. The placenta was felt to be lying entirely over the internal os. As the patient was not in labor and the diagnosis was complete placenta previa, abdominal cesarean section was decided upon.

While the cesarean section outfit was being prepared, the patient was transfused with 500 cc of her husband's blood by the direct method. Under gas-oxygen-ether anesthesia, a section was performed with the delivery of a full-term, normal, 8 lb baby. The placenta lay completely over the

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PROTECTING OUR MINORITIES

THE people of Boston more, perhaps, than any similar group in the country, deserve congratulations on having over and surrounding them a guardianship which, like Him that watcheth over Israel, neither sleeps nor slumbers. Modern censorship has indeed derived a rich inheritance from the spirit of our Puritan ancestors, who guaranteed to all, the right to think and worship as they did themselves.

True, lapses have occurred during the intervening years, in which the spirit of tolerance has raised its ugly head and flashes of personal liberty have shot their sparks against a sturdy Victorian *ostrichism*, but these were only flashes in the pan. Totalitarianism is behind the wheel, guaranteeing to its helpless minorities that they shall not learn where babies come from, nor how

No doubt censorships have their uses, and now it has been demonstrated that even *Life* itself can be censored. The disabling facts about censorships, however, are that they create an appetite, through curiosity, for this information that is being withheld, and direct attention to what might otherwise have received only casual notice.

The magazine, *Life*, is to be congratulated on the free advertising that it has received in Boston. Every so often some play, some book or some periodical is thus benefited in the Hub of the Universe.

PROPOSED LEGISLATION AGAINST THE SALE OF ALCOHOL

MASSACHUSETTS has frequently been a leader in progressive movements for the betterment of humanity, and her legislative acts have often served as models for other states to copy. Unfortunately the wisdom responsible for this highly creditable record has occasionally been in abeyance, and regrettable results have sometimes followed such lapses. A striking example in this respect is the legislation which, on the repeal of prohibition, authorized the free sale of 95 per cent ethyl alcohol by druggists. Camouflaged by the requirement that the alcohol was to be used "for mechanical, chemical and medicinal purposes only," it is generally agreed that practically all of it so sold is used for beverage purposes. The dangers arising from its beverage use are due to failure to dilute the product properly as intoxication comes on, and to the accumulation of the alcohol in the blood and organs, notably the brain, in excessive amounts. When the alcohol content of the brain reaches 0.5 per cent the outcome is usually fatal.

As should have been expected, this legislation has resulted in a very great increase in the mortality from alcoholism. Outside of Massachusetts, statistics compiled since the repeal of prohibition record a lowering in the mortality from alcoholism throughout the country. The only significant difference between the alcohol-control methods in Massachusetts and in other states is the absence in

the latter of legislation authorizing the free sale of concentrated ethyl alcohol

Furthermore, there is evidence that the increase in deaths is largely among the poor, and there are indications that welfare money has been used in many cases for the purchase of alcohol. The combined results of the depression and unemployment, and the too easy access to cheap concentrated alcohol, are apparently responsible for a large part of the death rate.

A bill (House 1044) has been introduced in the Legislature for the purpose of regulating this abnormal situation. Since alcoholism is basically a public-health problem, so considered and treated in European countries, it becomes the duty of the medical profession to exert its efforts toward the correction of this serious fault in our legislation—a fault which has resulted, since the repeal of prohibition, in an annual increase of 100 deaths over the already high death rate from this cause in the Southern Medical Examiner District of Suffolk County alone.

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In *The Commonwealth* Dr. Chadwick stated "This policy is based on the thesis that the practicing physician is the keyman in the cancer control movement. It is he who will first see the cancer case, it is he who must educate his patients to detect the early signs of the disease it is he who must guide the patient to adequate therapy."

"Group study is indicated in the diagnosis of cancer and the outlining of methods of treatment of the disease for cancer is so complex a subject that the opinions of the surgeon, radiologist and pathologist, as well as that of the cancer specialist, are needed. The state aided cancer clinics in Massachusetts are prepared to furnish group diagnosis and advice on types of therapy as a consultation service for the physician."

"The lay cancer committees of the town are to be known as the Co-operative Cancer Control Committees. They will arrange meetings, preferably in small groups and invite the local physicians to discuss with them the subject of cancer."

The outstanding accomplishments of the Division of Adult Hygiene in 1937 are incorporated in the following table

	1927	1933	1934	1935	1936	1937
Cancer death rate per 100 000 population	132.0	145.1	154.1	149.0	135.0	155.1
Female cancer death rate per 100 000 population age group 20-60	118.8	115.2	120.9	111.0	111 "	
Median delay in months of patients with cancer between first symptoms and visit to physician	6.0	6.1	6.2	6.1	5.0	5.0
Percentage of patients with cancer going within one month of first symptoms to physician		12.4	15.9	18.1	15.5	18.5
Percentage of patients with cancer attending cancer clinics referred by physicians	44.8	68.3	70.5	74.0	79.9	86.3
Total individuals with cancer attending cancer clinics	302	1015	1047	1042	1262	1319
Percentage of patients with cancer alive ten years after attending cancer clinics						24.5
Number of teaching clinics	0	2	6	16	42	69
Total number of physicians attending teaching clinics		75	190	422	843	1334
Percentage of physicians sending pathologic specimens from organized Co-operative Cancer Control Committee communities				4.6		13.9
Percentage of physicians sending pathologic specimens from non organized Co-operative Cancer Control Committee communities				3.2		6.8

For many years the crude death rate from cancer has been increasing. This is due in part to improved diagnoses, in part to an aging of the population, and in part, possibly to other non-ascertained causes. In the last few years, however, this rate is becoming stationary. When women alone are considered and when the effect of the aging of the population is partially removed by considering the age group between twenty and sixty, there has been in 1935 and 1936 a decided drop in the rate. The 1937 figures are not yet available, but from the crude rate it is felt that there may be an even greater improvement in this age specific rate.

The delay between the first recognizable symptoms of the disease and the time when the patient presents him

self to a physician is one measure of the effectiveness of public education in cancer. While it is impossible to obtain such a figure from all individuals with cancer, it is believed that the sample obtained at the Massachusetts state-aided cancer clinics is sufficiently representative to warrant a more or less general statement. Between 1927 and 1935 this period of delay fluctuated in the neighborhood of 6.0 months—the highest figure being 6.5 months and the lowest 6.0 months. In 1936 it dropped to 5.0 months and had held this rate through 1937. Five months is too long a period for an individual with cancer to delay before consulting a physician, but it is a decided improvement over six and a fraction months.

Another estimate of a similar nature is the percentage of individuals who go to their physicians within the first month of recognizable symptoms. In 1933 this percentage was 12.4. In 1937 it had risen to 18.5, the highest figure since the inception of the Massachusetts Cancer Program.

More and more the physicians of Massachusetts are taking the lead in referring patients to the cancer clinics. In the early days of the movement many patients came to the clinics because of newspaper publicity, and the percentage referred by physicians was relatively small. In the first year of the clinics the physicians referred 44.8 per cent of all cancer patients attending the clinics. In 1937 this figure increased to 86.3 per cent.

The total individuals with cancer attending the clinics has steadily increased. In the first year there were 302 in 1937 there were 1319. The total visits at the cancer clinics in 1937, including new and old cancer patients as well as non-cancer patients, was 12,454. Of the new patients, about one third had cancer. Of the old patients, a much larger percentage had cancer. Many of the visits of the old patients were repeat visits of the same individuals.

Of the group of 302 cancer patients who came in 1927, 24.5 per cent were alive ten years after coming to the clinic. This does not necessarily mean that all of them were cured cases. Some of them were not, but it is felt that years of longevity may well be a measure of success in a cancer program.

Teaching clinics were not instituted until 1933. Their numbers have rapidly increased from two in the first year to sixty nine in the last. The attendance of physicians at these clinics numbered 75 in the first year and 1334 in 1937—a great increase.

Another method of measuring the influence of the Co-operative Cancer Control Committee is found in the use made of the Tumor Diagnosis Service by physicians living in communities that have been organized contrasted with those living in communities that have not been organized. In 1935, 4.6 per cent of the total number of physicians in the communities that have been organized prior to January 1, 1938, sent specimens to the Tumor Diagnosis Service. From the same communities in 1937, 13.9 per cent of the physicians made use of this service. Similar figures from the non-organized communities increased from 3.2 per cent to 6.8 per cent. It should also be pointed out that in some of the organized communities, pathological services have been set up, which would make this figure even more important. Furthermore, in 1935, some of the communities were organized and others were not organized until late in 1937. This again strengthens the importance of the difference between 4.6 per cent and 13.9 per cent.

All these figures indicate that the present program is gradually accomplishing its end. The combined efforts of the medical profession and the public are being felt and

cancer control today seems nearer than ever before (Reprinted from *Cancer Bulletin*, Massachusetts Department of Public Health, Division of Adult Hygiene, Number 57, April 1, 1938)

NOTES

Among the recipients of Guggenheim Fellowships for 1938 are the following Dr Jack H Sandground, assistant professor of tropical medicine, Harvard Medical School—to study several problems in comparative parasitology in the Dutch East Indies, Dr Clyde E Keeler, instructor in ophthalmic research, Harvard Medical School—to collect material on genetics in relation to medicine, and Dr Alfred G Marshak, research fellow, New England Deaconess Hospital—to investigate the mechanism of chromosome division, especially the nature of chromosome structure as revealed by response to treatment with x rays and with neutrons

CORRESPONDENCE

DEPARTMENT OF MENTAL DISEASES

To the Editor A comparison of the latest list of trustees of the state hospitals under the Massachusetts Department of Mental Diseases with the list of trustees given in the 1933 report of this department (Governor Curley was elected in 1934) shows that by death, resignation or failure of reappointment, the Commonwealth has lost the services of twelve doctors, namely Theodore S Bacon, Enos H. Bigelow, Theodore Chamberlain, Laurence D Chapin, Albert Evans, Channing Frothingham, Charles B Frothingham, Abraham Myerson, Allan W Rowe, Henry S Rowen, J Vincent Thuot and Frederick A Washburn

In this list are one of the leading psychiatrists, one of the leading physiological chemists and one of the leading hospital administrators in the United States and the president of the Massachusetts Medical Society. In their stead, the governors have seen fit to appoint nine laymen and three doctors, namely Jeremiah A. Greene, E. Lewis Hartnett and Michael James Shaughnessy,—excellent men,—but three men cannot take the place of twelve.

Other able citizens whose names no longer appear on the lists of trustees are the Hon William J Sullivan, Mrs Esther M Andrews, Dr Henry Lefavour, Mrs Edna W Dreyfus, Albion L. Danforth, Charles A Littlefield, Horace A Keith, Professor Richard T Fisher, Francis Prescott, Frank B Hall, Walter Channing, Walter L Stevens, Arthur B Reed, Henry K. Hyde, Miss Frances E Cheney, Professor Thomas N Carver, to name a few. Here are valuable members of the community whose services and wisdom the Commonwealth can ill afford to lose.

As is well known, Dr Overholser, former commissioner, was not reappointed. He is now superintendent of St. Elizabeth's Hospital, the great federal hospital in Washington, and professor of psychiatry at George Washington University. Dr Clarence D Barrett, assistant commissioner, resigned and now heads the Department of Mental Diseases in Michigan. Another able physician, Dr Charles S Woodall, has resigned from the Fernald State School staff to be superintendent of a hospital in Vermont. Dr James V May, who in spite of ill health was persuaded to serve as commissioner for a time after the untimely death of Dr Kline, and who is a former president of the American Psychiatric Association, was forced to resign from his position as superintendent of the Boston State Hospital, and other members of the staff of

that hospital after long years of faithful service have summarily been separated from their positions. Miss Josephine E Thurlow, recently appointed chairman of the trustees of that hospital, is now handicapped in the performance of her duties by residence in North Adams.

Unless the distribution of hospital beds in Massachusetts varies from the ratio throughout the country, the 26,000-odd beds under the control of the Department of Mental Diseases represents more than half of the hospital beds in the state of Massachusetts.

Surely, the lamentable condition in the Department of Mental Diseases should be of interest to the physicians of Massachusetts and to the Massachusetts Medical Society!

Only a feeble minded optimist can believe that politicians will stop being interested in a state department that expends more money than any other department of the State except the Department of Public Works. Nor will the morale of the service be improved by giving more power to the governor and even less power to the trustees. Already, the power of the trustees is little more than that of criticism and inspection, yet they are held responsible for malfunctioning, which they have no power to rectify.

Until politics and public health are dissociated, we physicians of Massachusetts must hang our heads in shame.

DONALD GREGG, M.D.

Wellesley, Massachusetts.

ANNUAL REGISTRATION

To the Editor In the March 17 issue of the *Journal* is a letter from Dr Richard Dutton, of Wakefield, concerning 'The Proposed Bill for Annual Registration in Massachusetts'. The letter contains, either by direct statement or by implication, so many inaccuracies that I think a supplementary statement setting forth some facts is needed. I have on another occasion suggested to Dr Dutton by letter that he refrain from making public statements if he is not informed as to their accuracy.

Dr Dutton's first statement is, "in 1936, 1937 and 1938 the State Board of Registration has made determined drives to compel the medical profession to 'trade in its permanent right to practice medicine in Massachusetts for an annual permit with varying and probably increasing restrictions'." In several respects this statement is not correct. The Board has made no "drive." Under the statute the Board may, if it sees fit, suggest to the legislature that certain changes be made in the law. The Board has limited its activity to making such recommendations as to annual registration of physicians. I have been asked again and again why the Board does not fight. Such "fight," "drive," "campaign" or other effort is outside the province of the Board, so that any victory won by Dr Dutton, for example, is a victory in which he alone is fighting.

I have a copy of House Bill 41 before me 'An Act to require annual licensing of qualified physicians'. It does not provide for the 'trading in' of a permanent right for an annual permit. It contains no reference to this 'permanent right' to which Dr Dutton refers, and no provision of this bill affects the permanent right of a physician to practice medicine except insofar as such bill becomes part of the law of the Commonwealth pertaining to the practice of medicine. For years the law has provided that any "offence against the laws of the Commonwealth relating thereto," that is, to the practice of his profession, may be grounds for revocation of a license to practice medicine.

Dr Dutton has stated on one occasion that he understood that if the Board had a grudge against a doctor it could refuse to renew his registration. The bill says that if certain specified conditions are fulfilled, the Board "shall give to each qualified registered physician a certificate." Dr Dutton's understanding is at fault. The bill is mandatory.

Dr Dutton says next The Council of the Massachusetts Medical Society has each year emphatically opposed such proposed legislation. The records of the Council however, show that in 1937 the Council at first approved such legislation and at a later meeting merely withdrew its approval. Here Dr Dutton's memory is at fault.

It is encouraging to those who are interested in the passage of this bill to learn from Dr Dutton's letter that "the Committee on Public Health of the State Legislature will probably favorably report a bill for annual registration."

Dr Dutton says next The present laws read that any physician opening an office must within two weeks present credentials and sign statements with the city or town clerk, and said clerk must transmit copy of the statement to the State Board of Registration within twenty four hours and both are subject to fines for not so doing. The law on this point, Chapter 112, Section 8, is before me. It covers nineteen lines in the statute book, so I shall not repeat it, Dr Dutton's paraphrase or abstract is inaccurate in several respects.

Dr Dutton then asks three questions and says many more might be asked. The many I cannot answer because I do not know what they are. Some kind of answer, approximately correct, can be made to the three, but will Dr Dutton specify the "other rigorous existing laws to which he refers that are not enforced?"

The specific "rigorous law concerning the nonenforcement of which Dr Dutton complains is the one of which he gives the inaccurate abstract, and to which reference has already been made. It has not been rigorously enforced because, by itself, it gives the Board so little help. Not infrequently enquiries are made concerning physicians. "Who is Dr Blank?" He is not in the directory of the American Medical Association and I do not find him in the telephone book. The reply from the Board is "He was registered by the Board in 1924, and the City Clerk reported in that year that he had opened an office in Boston. We have never heard from him since. The report from a city clerk fourteen years ago does not really help much now.

The second question is, "How do lapses affect malpractice insurance?" Here Dr Dutton is again inaccurate. What does he mean by 'lapse'? There is no lapse of registration since registration cannot lapse and so malpractice insurance cannot be affected. Also since malpractice is specified by the statute as ground for revocation of license the insurance would be of no effect against action by the Board. It must be that Dr Dutton is writing about something other than what he says.

The third question is, "Would the medical profession continue to be ruggedly independent. Have you stopped beating your wife." The answer, of course, is not merely 'Yes' or 'No'. If there is any rugged independence in the profession, it will not be affected by the bill.

It is true, I think, that in every state in which annual registration of physicians has become statutory, there have been found some persons practicing under the licenses of deceased physicians. Within two weeks I have been credibly informed concerning a man who practiced for thirty years in Massachusetts under the license of a de-

ceased physician. I intentionally omit identifying details, but the matter recently came to light after the death of this unlicensed person. It is reported that the chiropractors are making vigorous efforts against this bill. Does Dr Dutton know what his co-laborers are doing and why?

When the Board, familiar with some of the difficulties of restricting the practice of medicine to persons duly licensed, says that annual registration of physicians will be distinctly helpful in law enforcement, presumably there is something in it. One might object on the ground that it will not work, that is, it will not accomplish what it is intended to accomplish. The answer to this is the testimony from other states, the law has been successful, and some states say they do not know how they could get along without it. One might complain that he refused to be taxed for this purpose. This objection must be dealt with on its merits. I presume that Dr Dutton would refuse to drive an automobile on the ground that he did not approve of some of the uses to which the gas tax is diverted.

The reason why the annual registration of physicians, or the annual licensing of physicians, will become statutory sometime, if not this year, is because the people of Massachusetts are entitled to know what persons are licensed to practice medicine, and what persons actually are practicing medicine in this State. This information should be made available in the form of lists printed annually and kept up to date. When the people know what is involved, they will demand the information and they will get it, as they cannot do now. Any talk about the 'regimentation' of physicians, the taking away from the physician his right to use his best judgment in practice, or the 'trading in' of any permanent right to practice, on the basis of House Bill 41, is merely silly.

STEPHEN RUSHMORE, M.D.

520 Commonwealth Avenue,
Boston

EARLY OPERATIONS FOR APPENDICITIS

To the Editor With the renewed interest in the treatment of appendicitis, the following account of the steps leading up to the first operations for the treatment of the disease may be of interest.

ALFRED WORCESTER, M.D.

Waltham, Massachusetts.

A half century ago when we were asked why there was more appendicitis in Waltham than in Boston our answer was that we so named our patients recoveries while elsewhere the death certificates for the same disease gave peritonitis as the cause. This though impolite was nevertheless the truth. It reminds me of what was said to me in London in 1888. I had been introduced by kind colleagues to famous British surgeons. The notes of introduction mentioned my familiarity with appendicitis. But I was astonished by the statement of my newly found friends that they had no such disease in England. Some years later one of these gentlemen postponed the coronation of Edward VII on account of the King's appendicitis. A few years later I persuaded Harvard to give him an honorary degree.

As a matter of fact Waltham is the place where the operation for appendicitis first became fashionable. And perhaps the story of what led up to this treatment of the disease will be of interest. During the spring and summer of 1883 when I was house physician at the Boston Lying in Hospital I had sad experiences with puerperal

peritonitis This tragic story I have told elsewhere (*New Eng J Med* 209 1109 1112, 1933) The pathologist at the Massachusetts General Hospital, Dr W F Whitney, kindly performed an autopsy on one of these patients The great accumulation of pus in the abdominal cavity of that poor woman made a great impression on me And later in that year, in my association with Dr E R Cutler, an autopsy which I had the misfortune to have to perform on a similar puerperal case gave the same result The next year at an autopsy on an older woman a large collection of pus was found in the right side of the abdomen Soon again one of my patients—a strong young man—died with his abdomen full of pus

My growing conviction that it would be better to have such collections of pus evacuated before rather than after death was strengthened by Dr B F D Adams, to whose practice I succeeded when he was obliged to leave Waltham for Colorado Springs He told me that if he were able to resume his practice he would employ surgical treatment in such cases Dr E R Cutler, my senior partner, had also come to the same conclusion We decided that in such cases if not allowed to employ surgery we would not continue in charge of them To Dr Cutler first came the test of our conclusion On June 20, 1886, one of his patients, a railroad conductor, after a few days' sickness, presented symptoms of an abscess in the right abdomen He consented to operation Then the question was how to get at the pus It would of course never do to make a direct attack That would violate all surgical canons And so Dr Cutler bored in from under Poupert's ligament The pus came out freely, and if there also presented a gangrenous mass, Dr Cutler failed to dislodge it But a few days afterward such an object appeared on the dressings Neither of us knew what it was We had never seen a gangrenous appendix Dr Cutler in his brief report of this case (*Boston M & S J* 70 554 556, 1889) mentions only a free discharge of faeces from the wound The man made a rapid and complete recovery

My turn came next On August 19, 1886, I was called to a case of a nine year-old girl who had just been sent home from the Massachusetts General Hospital to die Her parents were told there that the case was inoperable When I told them of my determination to continue in charge of such a case only when allowed to employ surgical treatment they naturally were at first very unwilling But two days later, on the ninth day of the disease, they consented, convinced that otherwise the child would die My operation (first reported by Dr Cutler in his article previously noted) was briefly as follows I aspirated through the loin, sucking pus flowed from the trocar Following the trocar with bistoury, dilators and then with my fingers, I found a small mass in the abscess cavity Dr Cutler insisted that I must have cut into the cecum and got hold of a lump of feces I protested this was not the case "Then pull it out, he said. Telling him it was hitched on, I asked for a double tenaculum and with this I pulled out the object Again neither of us knew what it was The child, however, made a rapid and complete recovery and is still living This was before Dr Fitz's famous pronouncement upon the cause of typhlitic abscesses The reason why Dr Cutler insisted even in his reports of these cases that the masses were merely feces is that we then knew the appendix vermiformis only as its name implies But we were making progress our patients made rapid recoveries.

In the next case of our series I was the patient I had had many previous attacks, some of them quite severe. But this time it was terrific Fortunately for me, my

classmate, Dr H A Wood, had begun his practice in Waltham, and to his unremitting care by night and day I owe in large degree my life But the surgeon who finally consented to my appeal for operation was Dr J W Elliot With Drs R H Fitz and M H Richardson in opposition, on the ground that I was too near death from general peritonitis, Dr Elliot boldly operated by direct incision over what I insisted was the seat of trouble He did not find the appendix but evacuated the pelvic abscess As this operation has been described by Dr Elliot (*Boston M & S J* 68-92 93, 1888), my own impressions would be of little value But when I read in Dr E A Codman's memoir of Dr Elliot that this operation was the first in the world where a man's abdomen was deliberately opened by a surgeon in search for the cause and relief of his peritonitis, I realized for the first time my real distinction

The next forward step in our Waltham progress toward the proper treatment was equally bold and brilliant During my convalescence Dr Cutler came to tell me about one of our neighbors who had just begun to have the same trouble I begged him to tell the man that if he would consent to immediate operation he no doubt would be saved from the suffering and danger I had just been passing through The man consented, and on December 23, 1887, Dr Cutler and Dr Wood after a direct abdominal section removed his inflamed and partially gangrenous appendix The man made an immediate recovery For Dr Cutler's modest report of this first perfect appendectomy, see his article previously noted.

With these experiences is it any wonder that we became convinced of the advisability and even the necessity of immediate operation in cases of appendicitis? But it was a long time before we Waltham men had the support of our professional brethren. Instead, we encountered their bitter opposition. In various records of medical meetings during the next few years reports may be found of discussions of Waltham's heresy, that is, of our departure from what was then held to be correct procedure. But I do not know if there was ever published a report of the meeting of the Suffolk District Medical Society at which I was hammered unmercifully The meeting was called for the discussion of the treatment of appendicitis. On the blackboard were written three questions to which the discussion should be confined The first question was, What should be the medical treatment of appendicitis? The second was, 'If surgery is employed, when should it supersede medical treatment?' The third was, 'If surgery is employed, where should the incision be made?' As a guest my turn came last. In answer to these questions, I said that there is no medical treatment for appendicitis, that the only proper treatment is surgical from the outset of the disease, and finally that the surgical incision should be, as always, over the seat of the trouble. I then exhibited eight diseased appendices which we Waltham men had removed from our patients I told them that seven of the patients had recovered, and that the eighth specimen had been taken from a dying man who begged for the operation even after I told him there was but one chance in a thousand of his survival I operated because I myself had begged so nearly in vain for operation after I had been told that I was near to death Then the storm broke. I was asked by an irate surgeon how I dared violate all surgical principles My answer was that it was because I was a coward and did not dare not to operate. Dr M H Richardson then said that he had operated fifty times on typhlitic abscesses and in none of these cases had he ever seen the appendix Then in the heat of the battle I declared that Dr Richardson by his own admission was not

competent to discuss the subject, in that he had never treated the disease but only its sequelae. This unhappily led to a breach between good friends.

Over our beer at the Tavern Club after the meeting Dr Fitz begged me to apologize to Dr Richardson, saying that I had cut him to the quick, but Dr Elliot insisted that I should not do so, for what I had said was the truth. So far as I remember Dr Elliot was my only backer at this large meeting. But after several years Dr Richardson forgave me. At the semi-centennial anniversary of the first use of ether as an anesthetic, he came to me at the

luncheon saying that he wanted to introduce me to Dr McBurney, of New York, who had become famous for his appendectomies. Dr Richardson said to him, "I want to introduce to you a man who took out the appendix before you ever heard of it." Dr McBurney asked me, "When did you first take out the appendix?" I replied, "In August, 1886. When did you first perform the operation?"

Goodness, not until 1888, or perhaps it was even 1889 that he said. After that Dr Richardson and I were even closer friends than we were before. He had by then become the foremost New England appendectomist.

ETHER-OPERATION PAINTING

To the Editor The painting, by A I Keller, of the ether operation at the Massachusetts General Hospital, October 16, 1846, which is here reproduced through the courtesy of Houghton-Mifflin Company, has appeared in many publications, and one would think that the original could be easily found. Attempts, however, to do so have failed, even though inquiries have been made at the

Massachusetts General Hospital, the Boston Museum of Fine Arts the Boston Public Library and elsewhere. Can any of our readers give this information? In addition, one would like to know something more about the circumstances under which this picture was painted.

HENRY R. VIETS, M.D.

6 Commonwealth Avenue, Boston.



THE FIRST PUBLIC DEMONSTRATION OF SURGICAL ANÆSTHESIA

Left to right Dr H J Bigelow Dr A A Gould Dr J Mason Warren Dr J C Warren
Dr W T C Morton Dr Samuel Parkman Dr S D Townsend Dr George Hayward

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

To the Editor In addition to the articles enumerated in our letter of February 26 the following have been accepted

The Drug Products Co

- Hyposols Sodium Cacodylate, $\frac{1}{4}$ gr (0.048 gm.), 1 cc
- Hyposols Sodium Cacodylate, $1\frac{1}{2}$ gr (0.10 gm.), 1 cc
- Hyposols Sodium Cacodylate, 3 gr (0.194 gm.), 1 cc
- Hyposols Sodium Cacodylate, 5 gr (0.324 gm.), 1 cc
- Hyposols Sodium Cacodylate, $7\frac{1}{2}$ gr (0.5 gm.), 5 cc

Eli Lilly & Co

Sulfanilamide Tablets, $7\frac{1}{2}$ gr (0.5 gm.)

Parke, Davis & Co

Tablets Sulfanilamide, $7\frac{1}{2}$ gr (0.5 gm.)

PAUL NICHOLAS LEECH, Secretary

535 North Dearborn Street,
Chicago, Illinois.

REPORTS OF MEETINGS

TRUDEAU SOCIETY

A meeting of the Trudeau Society was held at the Beth Israel Hospital on February 24. Dr Leon A. Alley, the chairman of the meeting, introduced the speaker of the evening, Dr Evarts A. Graham, of St. Louis, whose subject was "The Problem of Bronchiogenic Carcinoma."

Dr Graham opened by stating that in his opinion all primary carcinomas of the lung are bronchiogenic in origin. He then divided bronchiogenic carcinomas into two groups: (1) squamous-cell carcinomas—a well defined group, both clinically and pathologically, (2) a large heterogeneous group of tumors including the so-called round cell carcinomas and oat-cell carcinomas, adenocarcinomas, and the recently much discussed adenomas. It was concerning this last tumor, the so-called benign adenoma of the bronchus, that Dr Graham talked in detail.

The benign adenomas arise from a bronchus and appear on bronchoscopy as smooth, round, vascular, pedunculated tumors. To the bronchoscopist it appears as if he were dealing with a benign tumor which he can completely remove. Histologic examination of these tumors reveals an encapsulated mass composed of cords of small round cells showing no mitotic figures. In the literature there is a widespread belief that they are benign in character, hence the name benign adenomas. It was the thesis of Dr Graham's talk that these should not be regarded as benign tumors, and furthermore, that they are related to the round-cell and oat-cell carcinomas and the adenocarcinomas of the lung.

The speaker then presented cases in which the diagnosis of adenoma was made at bronchoscopic examination and confirmed by biopsy, in some of the cases it was felt by the bronchoscopist that all the tumor had been removed. Opportunity for further examination of the involved lung was obtained either through pneumonectomy or autopsy. Examination showed that all the tumor had not been removed at bronchoscopy, and that in some areas the remaining tumor cells were invading blood and lymph vessels. In his series of cases of adenoma, metastases have been found in mediastinal lymph nodes, in the parietal pleura and in many distant organs, particularly the adrenals and kidneys. Hence these tumors cannot be considered to be benign, and as their histologic structure is not that of an adenoma, the term benign adenoma is a most unfortunate one.

Dr Graham then projected a series of slides to show that material closely resembling fetal mesenchyme and fetal bronchi is sometimes found in these tumors. In fact there is a startling histologic resemblance between fetal lung tissue and biopsy specimens of these adenomas. In addition, bone and cartilage are seen in these tumors. Turning to the embryologic development of the lung, he showed that in the course of normal development there are excessive numbers of bronchial anlagen, many of which normally atrophy. He then postulated that these tumors arise from bronchial anlagen which would normally atrophy but for some reason fail to do so, and suggested the term 'embryoma' as a more fitting name. Tumors arising from these anlagen would be expected to contain more than one type of tissue: connective tissue, bone and cartilage, as well as epithelial cells are found in these tumors. In Dr Graham's opinion the rare chondromas, fibromas, fibrosarcomas and lipomas have the same origin, and represent varying lines of differentiation. He suggested that in addition the round cell and oat-cell carcinomas and the adenocarcinomas have a similar origin from bronchial anlagen which have failed to atrophy.

In support of this theory, he showed that the lungs containing adenomas often have certain developmental abnormalities, such as, small accessory bronchi (in one case the lung contained ten or twelve of such bronchi), accessory lobulation, and abnormal development of fissures.

These tumors, and bronchiogenic tumors in general, are peculiar in that they often occur in young individuals. Many of the patients have a very long history of pulmonary symptoms, sometimes as long as eighteen years.

In summary, Dr Graham pointed out that the term adenoma was a very poor one, that these tumors should be regarded as potentially malignant, and that while bronchoscopic removal may be occasionally complete, more often a portion of the tumor is left behind.

The discussion was opened by Dr Edward D. Churchill, who agreed that the term, adenoma, was a poor one. He stated that he was attracted to the hypothesis that these tumors arise from embryologic defects and agreed that these tumors should be regarded as dangerous lesions. Dr Richard H. Overholt illustrated by figures from his clinic that the clinical diagnosis of carcinoma of the lung is now being made in a high percentage of cases, and that the mortality rate following pneumonectomy has now reached a surprisingly low figure, only 1 death having resulted from 11 pneumonectomies done in 1936 and 1937.

Following this a number of questions were asked of Dr Graham, who, in closing, answered as follows: (1) in the vast majority of cases fluid in the pleural cavity in cases of pulmonary carcinoma indicates pleural metastases and is a contraindication to operation, (2) it is possible to find malignant cells in pleural fluid in an appreciable percentage of cases, (3) in a case presented by Dr Henry L. Cabitt, in which an "adenoma" had been removed bronchoscopically and which now shows no evidence of tumor, he advised against an immediate pneumonectomy and favored waiting with close observation, (4) true papillomas of the bronchus do occur, but they are exceedingly rare, (5) there is no evidence that tuberculosis and bronchiectasis have any etiologic relation to pulmonary carcinoma, (6) in commenting upon a question concerning an apparent discrepancy between the results in Jackson's series of cases and his own conception of the nature of adenomas, he emphasized that he did not deny that in some cases bronchoscopic removal effects a cure, but that he did feel such an outcome is rare. He also pointed out that these tumors have the peculiar ability to form scar tissue at the point of biopsy, and that this may delude the bronchoscopist at subsequent examinations into believing no tumor is left behind.

NEW ENGLAND HEART ASSOCIATION

The regular monthly meeting of the New England Heart Association was held at the New England Deaconess Hospital on February 28. The following program was presented:

PROGNOSIS OF ADULT WOMEN WITH MITRAL STENOSIS. Burton E. Hamilton, M.D.

A group of 100 women of childbearing age, averaging twenty-nine years, with chronic rheumatic heart disease, were re-examined after an average interval of ten years. There were only 6 cases of rheumatic fever in 900 patient years. There was little evidence of a tendency for the rheumatic disease to progress, and less evidence that it tended to improve. Twenty-nine died. Seventy-four were in a favorable group when first seen, 20 per cent died. Of 26 in an unfavorable group, 54 per cent died. The mortality rate in the whole group and in all subdivisions were definitely better than that reported by Grant from a follow up of British soldiers with chronic heart disease. Among women who had uncomplicated mitral stenosis where a diastolic murmur of the aortic type appeared later, more often than not this murmur persisted. There was, however, definite evi-

dence of an inconstant diastolic murmur of the aortic type in some patients with mitral stenosis. This is a preliminary report. A report on a larger group will be made later.

THE HEART IN POSTOPERATIVE DEATHS Shields Warren, M.D.

In the period from January 1, 1927 to June 30, 1937 there were 252 postoperative deaths autopsied in this laboratory. These cases were primarily derived from the New England Deaconess, the Palmer Memorial, and the New England Baptist hospitals, although a scattering of other cases are included. These cases represent 14 per cent of the autopsies (1756) during this period.

Those cases dying within one month after operation are considered as postoperative deaths provided that the death was not due to the natural course of the condition for which the operation was done. Thus if the patient died of metastases of carcinoma of the rectum following a palliative loop colostomy, it was not considered as an operative death. Two groups of cases representing unusual surgical hazards have been excluded. These are the cases of brain surgery and of chest surgery.

Twenty-six of 252 postoperative deaths, or 10.3 per cent, were cardiac. This is the fourth most important cause, being outranked by sepsis, pulmonary embolus and pneumonia.

Naturally these fatalities occurred in old individuals. The average age was 62.6 years, the youngest patient was forty years of age, the oldest eighty-three. Postoperative cardiac death, therefore, is almost entirely a problem of the later decades. Sixteen of the patients were male, 10 female. The youngest patient dying of a cardiac death was a woman of forty years of age, dying of coronary sclerosis immediately following a hysterectomy. She was moderately obese which was undoubtedly an important factor.

The predominant lesion in this group is coronary disease. The primary disease for which operation was done ranged from renal calculus to carcinoma. Several diabetic and thyroid cases are represented.

Subacute bacterial endocarditis (due to *Streptococcus viridans*) occurred in only 1 patient, a woman of sixty-nine, dying two days after vulvectomy for carcinoma. It might be mentioned in passing that in the generally weakened condition of patients with advanced carcinoma it is not unusual to encounter early lesions of bacterial endocarditis. However, this is the only instance I have encountered where death was due to endocarditis itself rather than to the accompanying cancer.

One case of acute pericarditis occurred, developing in a sixty-two-year-old man who died eight days after a transurethral prostatectomy.

Two deaths occurred from auricular flutter, the first secondary to a congenital heart condition, the other secondary to hyperthyroidism.

Before taking up coronary occlusion in great detail I shall speak briefly of the means of recognizing coronary occlusions. The time honored method of opening the coronary artery with scissors is one that is eminently suited to destroy all evidence of any but the most clearly defined coronary occlusions. The point of the scissors will plow a path through all but the best established thrombus or atheromatous plaque, and the pressure by the blades of the scissors makes it most difficult to tell the exact nature of the lesion. As Dr. Leary has so clearly emphasized, transverse multiple sections of the coronary with a knife usually provide the most satisfactory visualization of the extent of disease present and the degree of

encroachment by atheromatous or thrombotic changes on the lumen. Even superior to this method is the beautiful radiographic technic worked out by Dr. Schlesinger, of the Beth Israel Hospital, who, by means of colored radiopaque injection masses with subsequent roentgenography and dissection, is able not only to demonstrate vascular occlusions and anastomoses, but the portions of the heart supplied by the right and left coronary vessels respectively.

The ideal method of detecting coronary lesions is that of Schlesinger, the next best multiple transection, the poorest the customary opening with scissors. It might not be amiss in this connection to remind you that the presence of demonstrable infarction of cardiac muscle is not only contingent upon coronary occlusion but is also conditioned by the time elapsed between the occlusion and death. A coronary occlusion resulting in immediate death gives no evidence of infarction. The changes that permit us to recognize infarction grossly require a period of two or more hours between cutting off the blood supply, and death. Microscopic evidence of infarction probably appears but little earlier.

If one waits for evidence of cardiac infarction before making a careful search for coronary occlusion, many cases will be missed because death is often too rapid to permit alteration in the myocardium. On the other hand the mere finding of an occlusion does not necessarily mean that it was the cause of death. Unless the occlusion occurs in a major branch it is quite possible for the myocardium to weather the storm. I have seen large numbers of old healed infarcts in a single heart.

As has been repeatedly pointed out, due to anastomotic circulation no appreciable fibrosis or degeneration of the myocardium may occur in spite of the presence of definite occlusion, particularly in the smaller branches. Gross evidence of recent infarction is present in about one quarter of the cases and in several instances both old and recent infarcts occur in the same heart.

Congestive heart failure is infrequent. Four of the 26 cardiac deaths were due to congestive failure, one a seventy-two-year-old woman who died twenty-nine days after cholecystectomy for a stone and who showed at autopsy several old and one recent infarct of the myocardium with occlusion of her left coronary, another a fifty-year-old man who died four days after a partial gastrectomy for ulcer and who showed at autopsy chronic vascular myocarditis without appreciable change in the larger vessels, another a sixty-nine-year-old man, dying two days after nephrostomy for calculus, whose heart showed chronic vascular myocarditis, and the last a sixty-nine-year-old male diabetic, dying twelve days after a Gritti-Stokes amputation for gangrene, with chronic vascular myocarditis.

When one considers that in this group of cases preoperative digitalization has not been the rule, the occurrence of only 4 congestive deaths postoperatively in ten years is rather suggestive that routine preoperative digitalization is not an essential procedure in the elderly surgical case. If coronary arteriosclerosis could be eliminated, the cardiac postoperative deaths would drop into practical obscurity.

HEART NOISES. Frank N. Allan, M.D.

A woman came for examination complaining of heart trouble of unusual nature. She had been disturbed by a noise synchronous with the heart beat which had appeared intermittently for two years. It frequently bothered her during the day, but was likely to be particularly troublesome when she was lying down at night. The

Dr Graham opened by stating that in his opinion all primary carcinomas of the lung are bronchiogenic in origin. He then divided bronchiogenic carcinomas into two groups (1) squamous-cell carcinomas—a well-defined group, both clinically and pathologically, (2) a large heterogeneous group of tumors including the so-called round-cell carcinomas and oat-cell carcinomas, adenocarcinomas, and the recently much discussed adenomas. It was concerning this last tumor, the so-called benign adenoma of the bronchus, that Dr Graham talked in detail.

The benign adenomas arise from a bronchus and appear on bronchoscopy as smooth, round, vascular, pedunculated tumors. To the bronchoscopist it appears as if he were dealing with a benign tumor which he can completely remove. Histologic examination of these tumors reveals an encapsulated mass composed of cords of small round cells showing no mitotic figures. In the literature there is a widespread belief that they are benign in character, hence the name benign adenomas. It was the thesis of Dr Graham's talk that these should not be regarded as benign tumors, and furthermore, that they are related to the round-cell and oat-cell carcinomas and the adenocarcinomas of the lung.

The speaker then presented cases in which the diagnosis of adenoma was made at bronchoscopic examination and confirmed by biopsy, in some of the cases it was felt by the bronchoscopist that all the tumor had been removed. Opportunity for further examination of the involved lung was obtained either through pneumonectomy or autopsy. Examination showed that all the tumor had not been removed at bronchoscopy, and that in some areas the remaining tumor cells were invading blood and lymph vessels. In his series of cases of adenoma, metastases have been found in mediastinal lymph nodes, in the parietal pleura and in many distant organs, particularly the adrenals and kidneys. Hence these tumors cannot be considered to be benign, and as their histologic structure is not that of an adenoma, the term benign adenoma is a most unfortunate one.

Dr Graham then projected a series of slides to show that material closely resembling fetal mesenchyme and fetal bronchi is sometimes found in these tumors. In fact there is a startling histologic resemblance between fetal lung tissue and biopsy specimens of these adenomas. In addition, bone and cartilage are seen in these tumors. Turning to the embryologic development of the lung, he showed that in the course of normal development there are excessive numbers of bronchial anlagen, many of which normally atrophy. He then postulated that these tumors arise from bronchial anlagen which would normally atrophy but for some reason fail to do so, and suggested the term "embryoma" as a more fitting name. Tumors arising from these anlagen would be expected to contain more than one type of tissue, connective tissue, bone and cartilage, as well as epithelial cells are found in these tumors. In Dr Graham's opinion the rare chondromas, fibromas, fibrosarcomas and lipomas have the same origin, and represent varying lines of differentiation. He suggested that in addition the round cell and oat-cell carcinomas and the adenocarcinomas have a similar origin from bronchial anlagen which have failed to atrophy.

In support of this theory, he showed that the lungs containing adenomas often have certain developmental abnormalities, such as, small accessory bronchi (in one case the lung contained ten or twelve of such bronchi), accessory lobulation, and abnormal development of fissures.

These tumors, and bronchiogenic tumors in general, are peculiar in that they often occur in young individuals. Many of the patients have a very long history of pulmonary symptoms, sometimes as long as eighteen years.

In summary, Dr Graham pointed out that the term adenoma was a very poor one, that these tumors should be regarded as potentially malignant, and that while bronchoscopic removal may be occasionally complete, more often a portion of the tumor is left behind.

The discussion was opened by Dr Edward D Churchill, who agreed that the term, adenoma, was a poor one. He stated that he was attracted to the hypothesis that these tumors arise from embryologic defects and agreed that these tumors should be regarded as dangerous lesions. Dr Richard H Overholt illustrated by figures from his clinic that the clinical diagnosis of carcinoma of the lung is now being made in a high percentage of cases, and that the mortality rate following pneumonectomy has now reached a surprisingly low figure, only 1 death having resulted from 11 pneumonectomies done in 1936 and 1937.

Following this a number of questions were asked of Dr Graham, who, in closing, answered as follows: (1) in the vast majority of cases fluid in the pleural cavity in cases of pulmonary carcinoma indicates pleural metastases and is a contraindication to operation, (2) it is possible to find malignant cells in pleural fluid in an appreciable percentage of cases, (3) in a case presented by Dr Henry L. Cabitt, in which an "adenoma" had been removed bronchoscopically and which now shows no evidence of tumor, he advised against an immediate pneumonectomy and favored waiting with close observation, (4) true papillomas of the bronchus do occur, but they are exceedingly rare, (5) there is no evidence that tuberculosis and bronchiectasis have any etiologic relation to pulmonary carcinoma, (6) in commenting upon a question concerning an apparent discrepancy between the results in Jackson's series of cases and his own conception of the nature of adenomas, he emphasized that he did not deny that in some cases bronchoscopic removal effects a cure, but that he did feel such an outcome is rare. He also pointed out that these tumors have the peculiar ability to form scar tissue at the point of biopsy, and that this may delude the bronchoscopist at subsequent examinations into believing no tumor is left behind.

NEW ENGLAND HEART ASSOCIATION

The regular monthly meeting of the New England Heart Association was held at the New England Deaconess Hospital on February 28. The following program was presented:

PROGNOSIS OF ADULT WOMEN WITH MITRAL STENOSIS Burton E Hamilton, M.D.

A group of 100 women of childbearing age, averaging twenty-nine years, with chronic rheumatic heart disease, were re-examined after an average interval of ten years. There were only 6 cases of rheumatic fever in 900 patient years. There was little evidence of a tendency for the rheumatic disease to progress, and less evidence that it tended to improve. Twenty-nine died. Seventy-four were in a favorable group when first seen, 20 per cent died. Of 26 in an unfavorable group, 54 per cent died. The mortality rate in the whole group and in all subdivisions were definitely better than that reported by Grant from a follow up of British soldiers with chronic heart disease. Among women who had uncomplicated mitral stenosis where a diastolic murmur of the aortic type appeared later, more often than not this murmur persisted. There was, however, definite evi-

Neither case developed edema or any signs of cardiac failure. In young cases of severe diabetic coma with anuria, therefore, there is little evidence that diabetic acidosis exerts any seriously harmful effect upon the heart.

SURGICAL TREATMENT OF HYPERTENSION Elmer C. Bartels, M.D.

Some benefits for patients with severe types of hypertension have been reported in recent years following the surgical interruption of the sympathetic fibers to the greater splanchnic region. Prior to 1937, operation was offered to a group of hypertensive patients who were usually more than fifty years of age and in whom evidences of great vascular change had taken place. It was evident that this group of 22 patients obtained subjective relief from the operation, although the blood pressure did not fall. In practically every instance in which headache was an outstanding symptom it was surprisingly relieved. Since the drop in blood pressure is the object of the operation care has been used in selecting patients who are more likely to obtain a definite beneficial result. Certain criteria have been laid down in selecting patients for the operation. The patient must be under forty years of age, evidence of advanced vascular injury to visceral organs, revealed by tests of renal and cardiac function, must not be present, and the blood pressure must approach a normal level when the patient is under induced rest or intravenous Pentothal-Sodium anesthesia. These requirements, of course, make the group of patients who are suitable for this operation small, and they make early diagnosis imperative. Early hypertension is usually asymptomatic, or evidence of nervous tension and occasional occipital headaches only are present. Many of the patients with hypertension who are suitable for this surgical procedure will therefore be found only after a routine general examination.

During 1937, 8 patients meeting the above requirements were subjected to operation. In all these cases the operation was that devised by Adson, in which the greater and lesser splanchnic nerves are divided subdiaphragmatically and resected with the lateral portion of the celiac ganglia with removal of the first and second lumbar ganglia and their rami. This approach permits bilateral exploration of the suprarenal glands.

A summary of the results in this group of patients from three months to one year after operation, gave the following results. One patient died of pulmonary embolus twenty days postoperatively. One patient with a very severe hypertension, having a diastolic pressure around 140 mm., has had a normal blood pressure for one year. Three patients have had a definite drop in the blood pressure which has been maintained. The blood pressure, however, did not reach a normal level. Three patients of the group, although having a normal postoperative pressure, gradually developed a blood pressure almost equal to the preoperative level.

GREATER BOSTON MEDICAL SOCIETY

A meeting of the Greater Boston Medical Society was held in the Beth Israel Hospital on March 1. Dr. Kermit C. Rosen opened the meeting and introduced the speaker of the evening, Dr. Edward D. Churchill, who talked on "Present Day Surgery of the Chest."

Dr. Churchill began by discussing the development of thoracic surgery. The members of the strictly anatomical school of surgeons, and at a later date, of the pathological school were unable to treat thoracic conditions successfully because they did not fully understand the physio-

logic and biochemical features. These last two basic sciences have been especially important in the rapid advance of chest surgery that has been made in the past ten or fifteen years. The understanding of homeostasis, fluid balance, pressure relations, and so forth, are all important parts of a thoracic surgeon's training.

The treatment of tuberculosis by surgery gave a great impetus to all thoracic surgery, as have the improvements in x-ray, bronchoscopy, the injection of opaque substances and pneumothorax. The American Association of Thoracic Surgeons by its broad-minded, open-door policy through which it has allowed many doctors not primarily thoracic surgeons to become members, has greatly forwarded the advance of knowledge in this field. The influenza epidemic in 1918 left many cases of empyema which needed surgical treatment, and in this way forwarded thoracic surgery, but because of the deforming operations then in vogue, greatly harmed this branch of medicine by putting it in disfavor in the minds of many doctors.

Operations on the chest need be deforming only when the disease leaves a huge suppurating process within the thorax. Lung abscesses were discussed particularly in relation to extirpation of a part or all of one lung. Dr. Churchill pointed out that many cases eventually need surgery. For the surgical treatment of these cases he prefers two stages. By the first he creates adhesions and then opens the cavity and drains it in the second stage. These cavities may slowly close themselves, but some will not. Of those that remain open, some may be closed by inserting a muscle flap into the cavity, but others are too large for this procedure and it is in these cases that Dr. Churchill advocates removal of one lobe or occasionally of the entire lung. There may, of course, be more than one cavity and at times multiple abscesses may simulate chronic cystic disease of the lung. A chronic abscess is a distinct hazard to the patient, and there is also danger of complete destruction, hemorrhage, and so forth. In a few cases, primary extirpation is done before prolonged medical treatment is tried. This is especially true in abscesses involving multiple lobes of the lung, as they respond so poorly to drainage. These cases, of course, heal much more rapidly, and the end result is much more satisfactory and less deforming. The patients may have a stormy convalescence, and there is still a high postoperative mortality.

Dr. Churchill also described bronchiectasis and its surgical treatment. He pointed out the manifold etiology of this condition and spoke of the lesions of the end stages. Bronchiectasis is not a clinical entity. Lipiodol injection is essential in its diagnosis and Dr. Churchill showed lantern slides demonstrating the frequent involvement of the left lower and right middle lobes in the same patient. This probably occurs because of the posture of the patient during coughing. The lingula of the left upper lobe is diseased in about 35 per cent of the cases. At times the disease is entirely confined to the middle lobe of the right lung, and rarely to the upper lobe alone. Congenital malformation giving a honeycombed lung was mentioned, as was also the type of bronchiectasis with obstruction of the bronchus and collapse.

Extirpation of the entire lung is at times necessary in the treatment of primary pulmonary carcinoma. The bronchus must be extirpated as high as possible in order to include the large nodes which are around the hilum. The nodes in this area are frequent sites of metastases, and at times, metastases are found in these nodes in the opposite lung. Bronchial obstruction is common in carcinomatous involvement. It is necessary to make an early

sound was so loud that it was heard for a considerable distance from the body. Not only the patient, but other people, could hear it, the latter even before the patient entered the room. She described it as resembling the splashing of water in a mill.

The cause of the noise was discovered more or less by accident. She had moderately severe anemia which had not responded to treatment. X-ray examination of the gastrointestinal tract was made in order to see if there was any lesion responsible for loss of blood. It was found that she had a diaphragmatic hernia, a large part of the stomach was lying in the chest. The sound was produced through the action of the beating heart on the contents of the intrathoracic stomach.

THE BLOOD SUGAR AND CIRCULATORY FUNCTION IN DIABETES Howard F Root, M.D.

The regulation of the concentration of sugar in the blood involves many factors, even if we omit, for the moment, consideration of those factors such as changes in blood and lymph volumes which would influence the total amount of glucose in the body. The blood sugar concentration represents the resultant of oxidation storage and excretion on the one hand and formation and absorption on the other. The relative constancy of the concentration of blood sugar in the normal animal, a manifestation of homeostasis in the words of Professor Cannon, is extraordinary since the production, storage, and utilization of sugar are effected by many hormonal and nervous factors. It must be remembered that in diabetes, where the insulin supply and its effectiveness are of chief importance, all the other factors which influence the blood sugar are still operating, and often in pancreatic diabetes there may be secondary disturbances in other endocrine glands and in other tissues which will affect carbohydrate metabolism. The concentration of the blood sugar then is to be regarded as an index for metabolic changes in the tissues. No student of diabetes regards the exact amount of sugar in the blood as itself of great significance, but there is no doubt that the variations in blood sugar are of tremendous importance because of the wide variety of changes to which the blood sugar may give the clue.

HYPOLYCEMIA DUE TO INSULIN Howard F Root, M.D.

The danger of hypoglycemia produced by doses of insulin has been greatly stressed. If one attempts to study the electrocardiograms of young diabetics, particularly children, before and after hypoglycemia produced by insulin, certain slight changes do appear in the electrocardiograms such as slight alterations in the height of the T waves, slight variations in the lengths of the PR interval, changes in the height of the R wave and occasional extrasystoles. In this series, the attempt was made to produce only slight degrees of hypoglycemia in contrast to the studies made in Germany in which schizophrenics were observed who were undergoing treatment with profound hypoglycemia by means of insulin. In the latter cases the authors reported occasional changes in the T waves, the rare onset of auricular fibrillation, and variation in the length of the PR interval, but their conclusions were the same as those with our young cases: (1) the changes do not bear a quantitative relation to the degree or the duration of hypoglycemia or to the amount of insulin used and (2) the changes are temporary and inconsequential.

When hypoglycemia is so produced by insulin striking differences in the clinical symptoms, particularly those

referable to the cardiovascular system, appear from patient to patient. For example, the pulse rate may be lowered. In one instance, a young man who came into the Deaconess Hospital in profound hypoglycemia, the pulse rate was 62. This pulse rate remained constant even when he was struggling violently and was being held by three men. The first intravenous injection of glucose solution produced no effect. When the second one was finally accomplished, he suddenly became conscious and immediately the pulse rate increased to 85. On the other hand, in many instances the pulse rate rises materially with the blood pressure. One may interpret these changes as due to variations in the amount of adrenaline called forth by the hypoglycemia. Why there are such variations from individual to individual is still a mystery. Certainly in the cases where the pulse rate is slowed it is reasonable to assume that the preponderant effect of the hypoglycemic state has been exerted upon the central nervous system and that the slowing of the heart rate is a vagus effect.

In one young woman, a school teacher, twenty six years of age, who accidentally received an excessive dose of insulin and died after twenty two hours of hypoglycemia, no pathologic changes at autopsy were observed.

In older patients with coronary disease the danger of hypoglycemia would seem to depend upon adrenergic response with increase in blood pressure and the increase in the work of the heart which, occurring suddenly, might conceivably be fatal. On the other hand, it must not be taken as a reason for omitting the use of insulin in older diabetics with coronary disease. If one tabulates patients who have died of coronary disease according to the length of insulin treatment it is clear that the longer such patients are treated with insulin, the longer they live.

EXTREME HYPOLYCEMIA AND DIABETIC COMA. Howard F Root, M.D.

It has often been thought that the heart suffered a severe toxic injury during acidosis, although little evidence of such fact has really been brought forth, aside from occasional slight changes in electrocardiograms. In deed, Hamilton and Faulkner concluded that such changes as occurred were due to changes in acid-base relations and were not of serious import. The following 2 cases are reported as illustrating a type of physiological test of cardiac function during severe coma. Each of these patients received more than 10,000 cc. of liquid given intravenously and subcutaneously during a period of comparatively few hours for the treatment of diabetic coma with anuria.

Case 1 A woman, aged 31 years, was admitted with a blood sugar of 1194 mg and a carbon-dioxide-combining power of 3 vol per cent. She was first given salt solution containing glucose. She became anuric and during the next 2 hours when no urine could be obtained the blood pressure steadily fell until she was pulseless. A cannula was then tied into the vein and the intravenous salt solution continued until she had received 8000 cc. intravenously. The blood pressure had risen and anuria was at an end after a period of 12 hours.

Case 2 This woman, aged 25 years, similarly received glucose solution and salt solution, and as a result, the blood sugar rose from 700 to 1000 mg and she became pulseless and anuric. Similar treatment brought back secretion of urine and a rising blood pressure, after a period of 12 hours.

BOSTON CITY HOSPITAL

A symposium on pulmonary disease will be held on Saturday, April 23, at 10 15 a. m., in the Dowling Amphitheater. The papers to be presented are as follows

Pneumonia. Dr Maxwell Finland.
Pulmonary Tuberculosis. Dr Theodore L. Badger
Clinical Aspects of Pulmonary Disease. Dr John A. Foley
Locating Empyema. Dr Francis W. Palfrey
Pulmonary Abscess. Dr Louis M. Freedman
Pulmonary Surgery. Dr John W. Strieder
Discussion. Dr Horace Binney

ROBERT M. GREEN, M.D., *Chairman*
Committee on Hospital Clinics

BOSTON SOCIETY OF PSYCHIATRY
AND NEUROLOGY

The next meeting of the Boston Society of Psychiatry and Neurology will be held at the Boston Medical Library, 8 Fenway, on Thursday evening, April 21, at 8 15

PROGRAM

Relief of Unilateral Paralysis Agitans by Section of the Pyramidal Tract. (Moving picture demonstration and presentation of case.) Dr Tracy J. Putnam

Electromyographic Studies in Spastic Conditions and in Paralysis Agitans. Dr Paul Hoefler and Dr Tracy J. Putnam

Results in the Treatment of Chronic Alcoholism by Benzadrine. A preliminary report. Dr Wilfred Bloomberg

The Incidence and Age of Cessation of Enuresis in One Thousand Neuropsychiatric Patients. Dr Joseph J. Michaels and Sylvia E. Goodman

H. HOUSTON MERRITT, M.D., *Secretary*

JOINT MEETING OF THE SUFFOLK DISTRICT
MEDICAL SOCIETY AND THE BOSTON
SURGICAL SOCIETY

There will be a joint meeting of the Suffolk District Medical Society and the Boston Surgical Society at the Boston Medical Library, 8 Fenway, on Wednesday evening, April 20, at 8 15

Dr Augustus Thorndike, Jr., will speak on Trauma Incident to Sport and Recreation. Diagnosis and treatment. The paper will be discussed by Drs. Bernard A. Godvin, Henry H. Faxon and Charles C. Lund

JOHN P. MONKS, M.D., *Secretary*
Suffolk District Medical Society

GRANTLEY W. TAYLOR, M.D., *Secretary*
Boston Surgical Society

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held on Thursday, April 21, in the Peter Bent Brigham Hospital amphitheater (Shattuck Street entrance), at 8 15 p. m. *Note change from usual day of meeting*

PROGRAM

Adrenalin Sensitivity in Hyperthyroidism. Dr Emil Goetsch, professor of surgery, Long Island College of Medicine.

The Value of Antitoxin in Scarlet Fever. Dr Francis G. Blake, Sterling Professor of Medicine, Yale University School of Medicine.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING
MONDAY, APRIL 18

MONDAY APRIL 18

*11:30 a. m. Carney Hospital. Monthly staff meeting and luncheon

WEDNESDAY APRIL 20

9 10 a. m. Boston Dispensary. Hospital case presentation. Dr S. J. Thannhauser

*12 m. Clinopathological conference. Children's Hospital amphitheater

5 15 p. m. Joint meeting of the Suffolk District Medical Society and the Boston Surgical Society. Boston Medical Library 8 Fenway

THURSDAY APRIL 21

8 30-9:30 a. m. Exchange visit surgical and orthopedic staffs of the Peter Bent Brigham and Children's hospitals, held this week at the Peter Bent Brigham Hospital. Rounds conducted by Emil Goetsch, professor of surgery, Long Island College of Medicine, surgeon-in-chief, Long Island College Hospital, Brooklyn, surgeon-in-chief pro tempore, Peter Bent Brigham Hospital

9-10 a. m. Boston Dispensary. Follow up of interesting diagnostic problems: presentation of former diagnostic hospital patients. Dr H. G. Brugh.

8 15 p. m. Boston Society of Psychiatry and Neurology. Boston Medical Library 8 Fenway

*8 15 p. m. Harvard Medical Society. Peter Bent Brigham Hospital amphitheater

FRIDAY APRIL 22

*9-10 a. m. Boston Dispensary. Surgery of Peripheral Vascular System. Dr James C. White.

*10 a. m. 12:30 p. m. Tumor clinic. Boston Dispensary

4 p. m. Massachusetts Society for Social Hygiene. State suite salon, Copley Plaza Hotel, Boston

SATURDAY APRIL 23

9 10 a. m. Boston Dispensary. Hospital case presentation. Dr Thannhauser

10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital. Conducted by Dr Henry A. Christian

10-15 a. m. Symposium on pulmonary disease. Boston City Hospital, Dowling amphitheater

SUNDAY APRIL 24

4 p. m. Illustrated public health lecture. Faulkner Hospital auditorium. Syphilis: its cause, prevalence and eradication. Dr Franklin Balch, Jr.

Open to the medical profession

APRIL 15—Boston Medical History Club. Boston Medical Library 8 Fenway, Boston

APRIL 15—Carney Hospital. Page 653

APRIL 15, 19 and 20—Thomas William Salmon Memorial Lectures. Page 450 issue of March 10

APRIL 20—New England Society of Physical Medicine. Page 653

APRIL 20—South End Medical Club. Page 623 issue of April 7

APRIL 21—Harvard Medical Society. Notice above.

APRIL 21—Boston Society of Psychiatry and Neurology. Notice above

APRIL 21—New England Pathological Society. Page 653

APRIL 22—Symposium in honor of Dr. Jelliffe. Page 533 issue of March 31

APRIL 22—Massachusetts Society for Social Hygiene. Page 653

APRIL 23—Massachusetts Memorial Hospitals, annual reunion of house officers, alumni association. Page 516 issue of March 24

APRIL 23—Symposium on pulmonary disease. Boston City Hospital. Notice above.

APRIL 25—New England Heart Association. Page 653

APRIL 26—Lawrence Cancer Clinic. Page 653

APRIL 26—New England Society of Psychiatry. Page 522 issue of February 17

MAY 12—Pentucket Association of Physicians. Hotel Bartlett 95 Main Street, Haverhill 8 30 p. m.

MAY 16 and 17—American Neisserian Medical Society. Page 532 issue of March 31

MAY 31, JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society. Hotel Bradford, Boston

JUNE 6, 7, 8 and 9—American Association of Industrial Physicians. Page 499 issue of March 17

JUNE 13-17—American Medical Association. San Francisco.

JUNE 13, OCTOBER 5 and NOVEMBER 15—American Board of Ophthalmology. Page 252, issue of February 10

SEPTEMBER 12-14—American Association for the Study of Goiter. Page 545 issue of March 24

OCTOBER 17-21—Clinical Congress of the American College of Surgeons, New York City

OCTOBER 24-26—Academy of Physical Medicine, Scientific Session. Washington, D. C.

diagnosis in these cases in order to obtain the best results, and the size of the tumor is not related directly to the prognosis. Dr Churchill pointed out that benign tumors may kill by infection or bronchial obstruction. Charts were shown to demonstrate the mortality in all cases done at the Massachusetts General Hospital. A total of 117 lobectomies were performed with a mortality of 68 per cent. The mortality of total pneumonectomies was between 35 and 50 per cent. The technic of this method was discussed. One hundred cases of primary carcinoma of the lung were classified, and it was found that 51 per cent of these were epidermoid carcinoma of the squamous-cell type, 21 per cent adenocarcinoma, and 28 per cent oat-cell or undifferentiated types.

NOTICES

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Boston Medical Library on Monday, April 25, at 8 15 p m.

PROGRAM

Heart Disease in Pregnancy at the Worcester City Hospital. Dr F B Carr, of Worcester.

Electrocardiographic Changes in Vitamin B Deficiency. Drs C C Dustin, H L C Weyler and C P Roberts, of Providence, Rhode Island.

Gall Bladder Disease and Coronary Sclerosis. Dr E H Drake, of Portland, Maine.

A Case of Hemophilia with Hemopericardium as a Result of Trauma. Dr C C Dustin, of Providence, Rhode Island.

Clinical Observations on the Use of Quinidine. Dr James Z Naurison, of Springfield.

Auricular Flutter. Report of an unusual case with some remarks about the history of our knowledge of this disorder. Dr Frank T Fulton, of Providence, Rhode Island.

Interested physicians and medical students are invited to attend.

JAMES M FIVULKNER, M.D., *Secretary*

CARNEY HOSPITAL

The monthly staff meeting and luncheon of the Carney Hospital will be held at the Carney Hospital on Monday, April 18, at 11 30 a m.

PROGRAM

Case Report. Vesico-vaginal fistula treated by colpocleisis. Dr L E Phaneuf.

Occiput Posterior Positions and Their Management. Dr B F Macchia.

Discussion by Drs J J Meehan, F Fortun and E L Kickham.

Physicians and medical students are invited to attend.

R J HEFFERNAN, M.D., *Secretary*

MASSACHUSETTS SOCIETY FOR SOCIAL HYGIENE

The annual meeting of the Massachusetts Society for Social Hygiene will be held in the State Suite Salon of the Copley Plaza Hotel, Boston, on Friday, April 22, at 4 00 p m.

Dr George G Smith, president, will review the work of the past year and Mr Lester W Dearborn will report on the progress of the counseling service of the society.

The guest speaker, the Honorable Kenneth D Johnson, former special justice of the district court of East Norfolk, will speak on 'Marriage—Can It Be Adjusted?'

The meeting will be open to the public without charge and a special invitation is extended to all physicians, medical students, nurses and social workers.

MRS S W MILLER, *Secretary*

NEW ENGLAND SOCIETY OF PHYSICAL MEDICINE

The regular meeting of the New England Society of Physical Medicine will be held at the Ring Sanatorium and Hospital, Arlington Heights, on Wednesday evening, April 20, at 8 00.

Dr William Benham Snow, associate in medicine, College of Physicians and Surgeons, Columbia University, and director of physical therapy, Columbia Presbyterian Medical Center, will speak on "The Rationality, Practicability and Limitations of Induced Fever as a Therapeutic Agent." Discussion by Dr Michel Pijoan and Dr Hosea W McAdoo.

The Council will meet at 6 o'clock, and dinner will be served in the main dining room of the Sanatorium at 6 30 p m.

All members of the medical profession are cordially invited to attend.

WILLIAM D McFEE, M.D., *Secretary*

LAWRENCE CANCER CLINIC

A special Lawrence Cancer Clinic, to be held at the Lawrence General Hospital, 1 Garden Street, Lawrence, on Tuesday, April 26, at 10 00 a m, will be a demonstration and teaching clinic for physicians, with Dr Channing C Simmons present as consultant. Physicians of the north half of Essex County are invited to accompany any of their patients whom they desire to have this service or to send them with a note. A report will be returned to every physician who sends a patient. The service is gratis. Any physician is welcome to attend the clinic.

A series of cured cancer cases will also be presented. This clinic is endorsed by the Committee on Postgraduate Instruction of the Massachusetts Medical Society.

ROY V BAKETEL, M.D.,
CHARLES J BURGESS, M.D.,
JOHN J McARDLE, M.D.,
HARRY H NEVERS, M.D.,
THOMAS V UNLAC, M.D.,
J FORREST BURNHAM, M.D., *Chairman*

NEW ENGLAND PATHOLOGICAL SOCIETY

There will be a meeting of the New England Pathological Society at the Worcester City Hospital, on Thursday, April 21, at 8 00 p m.

PROGRAM

Monocytic Leukemia with a Report of Two Cases. Dr Louise M. Norton.

A Study of Lymphoid Nodules in Bone Marrow. Dr Robert Williams.

A Study of Central Autolysis of the Adrenal Glands. Dr William Freeman.

Members of the medical profession are cordially invited to attend.

J B HAZARD, M.D., *Secretary*

the greater part of her time in the British Museum Library. The book under review is the result of her efforts.

The subject is covered adequately from ancient times through the end of the eighteenth century. The author seems not to have missed any important woman physician in the history of medicine and many historians will be grateful to her for bringing to light the names of many previously unknown. Naturally, her best efforts are directed toward Trotula, the great woman physician of Salerno. There seems to be no one quite so outstanding as this woman physician and teacher in the whole history of female medicine. Long chapters follow on the medical women of the twelfth through the eighteenth centuries, each century receiving a careful analysis of thirty to forty pages. In addition, the book is profusely illustrated but, unfortunately, neither the plates nor the figures are numbered and there is no reference to them in the text. The references to the literature, given as footnotes to each page, are, in general, correct, but their form is irregular and the use of "op cit." is greatly to be deplored. The book is fairly well printed and has an adequate index. In general, it speaks for the scholarly work of the author and must be considered the outstanding volume on this subject.

The Conquest of Cholera America's greatest scourge
J S Chambers. 366 pp New York The Macmillan Company, 1938 \$4.75

This book has held the reviewer's attention from cover to cover. The author presents an absorbing story of the halting progress of scientific truth in a dramatic field of medical history.

The several epidemics of cholera which have swept over our country in the past are portrayed in a vivid and pleasing style. Apt quotations from contemporary sources contribute high lights as well as dark shadows to the picture.

The text is scholarly, well documented and reveals study of the subject along very broad lines. This book can be read with profit as well as pleasure not only by physicians and medical students but also by laymen.

Claude Bernard Physiologist J M D Olmsted. 272 pp
New York and London Harper & Brothers, Publishers, 1938 \$4.00

Claude Bernard may be rightfully designated as the father of modern physiology. His life is therefore of great interest to all physicians. Born of relatively obscure parents, he started his career by writing a play while he was working in a pharmacy to earn his living. Taking the play to Paris, he was advised not to adopt literature, but to study medicine. This he promptly did, although he never entered into practice. He soon saw the great opportunity open to him, in the middle of the nineteenth century, for physiological experimentation, and having a sort of intuitive power for investigation with assurance and precision of action, he shortly discovered the glycogenic function of the liver and the important part that the brain plays in carbohydrate metabolism. Most of his early work had to do with digestion, particularly the function of the pancreas. Later he turned to the action of nerves, muscle physiology and the effects of poisons.

A contemporary of Pasteur he was considered by many during his life as the greater man. Pasteur, however, has grown with the years whereas Bernard's influence except in the strict field of physiology, has not been widely appreciated. Professor Olmsted's book will do much to overcome this point of view. The first half of the book deals with the biography of the man while in the

latter half his discoveries are taken up in detail. Well illustrated and carefully documented, this book is a distinct addition to medical biography and should be widely read.

Collected Papers on Tuberculosis Sir Robert W Philip
460 pp New York Oxford University Press, London
Humphrey Milford, 1937 \$7.50

Sir Robert Philip is an outstanding authority on tuberculosis. He graduated from medical school in 1882, the year when Koch announced the discovery of the tubercle bacillus and ever since has been a leader in the British campaign for the eradication of the disease. The present volume presents twenty-four papers and addresses covering the period from 1898 to 1934. Here are summarized the writer's contributions to science and society.

Most of the papers have to do with the organization of the agencies which have been developed to fight tuberculous infection. The author has worked for the establishment of the dispensaries, sanatoriums, hospitals for advanced cases, tuberculosis colonies, and so on. He was also a prime mover in the effort to make compulsory the reporting of cases of pulmonary tuberculosis. Of particular interest is the last paper entitled, "Musings in the Garden Fifty years association with the tubercle bacillus."

On the scientific side, the author has stressed the open air treatment of the disease, and still believes that tuberculin plays an important part in the treatment as well as in diagnosis of tuberculosis. He also makes a great point of the importance of tuberculous infection in the lymphatic system, and thinks that tubercle bacilli are usually carried to the lungs not by direct inhalation but through the lymphatics after having penetrated the mucous membrane of the pharynx.

These papers are of historical importance, and make interesting reading.

Handbook on Nasal Accessory Sinuses Frank L. Alley
121 pp Kingsport, Tennessee Kingsport Press, Inc., 1937 \$2.00

This small handbook of 120 pages, two thirds of which is devoted to operative procedures on the nasal sinuses, is essentially a collection of lectures. The early chapters deal briefly with anatomy, symptomatology, pathology and diagnosis.

It is evident that the subject would make an interesting presentation to students if supplemented by charts and anatomical and clinical demonstrations. The almost total lack of illustrations, either anatomical or clinical, so reduces the effectiveness of the text as to leave one in doubt for whom the book is intended. Any specialist sufficiently versed in operative technic so as to need no textual illustrations would find little that he does not already know. For the general practitioner for whom sinus surgery is utterly outside his field, the rather brief presentation of symptomatology and diagnosis would not seem adequate, even if perused for more than "a few hours." The masquerading of empyema as "emphysema" and "emphvema" leaves something to be desired in proof reading.

The Management of the Pneumonias For physicians and medical students Oxford Medical Publications, Jesse G M Bullowa. 508 pp New York Oxford University Press, 1937 \$8.50

This is a timely book. It treats very well the whole problem of the management of the pneumonias. However, it is of especial interest to physicians who are dealing with

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p m New Bedford

ESSEX SOUTH

MAY 5—Censors meet at Salem Hospital 3 30 p m

MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p m Speaker and subject to be announced

FRANKLIN

Meeting will be held at the Franklin County Hospital Greenfield at 11 a m the second Tuesday of May

HAMPTON

Meetings will be held on the fourth Tuesday in April and July

HAMPSHIRE

MAY 11—Page 546 Issue of March 24

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club Stonham at 12 15 p m. on May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club Lowell on April 27

NORFOLK DISTRICT

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

MAY 5—Annual meeting at 12 noon

PLYMOUTH

Meetings will be held at 11 a m. on April 21 May 19 and July 21

SUFFOLK

APRIL 20—Joint meeting of the Suffolk District Medical Society and the Boston Surgical Society Page 659

WORCESTER

MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced.

BOOKS RECEIVED FOR REVIEW

Health Insurance The next step in social security Louis S Reed 281 pp New York and London Harper & Brothers, Publishers, 1937 \$5.00

A History of Women in Medicine From the earliest times to the beginning of the nineteenth century Kate Campbell Hurd Mead 569 pp Haddam The Haddam Press, 1938 \$6.00

Collected Papers on Tuberculosis Sir Robert W Philip 460 pp New York Oxford University Press, London Humphrey Milford, 1937 \$7.50

The Compleat Pediatrician Practical diagnostic therapeutic, and preventive pediatrics Wilburt C Davison Second edition. 243 pp Durham, N C Duke University Press, 1938 \$4.00

Practical Bacteriology, Haematology and Animal Parasitology E R. Stutt, Paul W Clough, and Mildred C Clough. Ninth edition 961 pp Philadelphia P Blakiston's Son and Company, Inc, 1938 \$7.00

A Textbook of Hematology William Magner 395 pp Philadelphia P Blakiston's Son and Company, Inc 1938 \$4.50

A Textbook of Ophthalmology Sanford R. Gifford 492 pp Philadelphia and London W B Saunders Company, 1938 \$4.00

Claude Bernard Physiologist J M. D. Olmsted 272 pp New York and London Harper & Brothers, Publishers, 1938 \$4.00

BOOK REVIEWS

Mentality and Homosexuality Samuel Kahn. 249 pp. Boston Meador Publishing Company, 1937 \$3.00

In this volume, Dr Kahn gives a description of homosexuality to determine the peculiarities of the homosexual and the causes, diagnosis, prognosis and therapy of this particular inversion. He has accumulated a mass of valuable material on male and female homosexuals, but this material is limited more to its descriptive than to its dynamic aspects. The fundamental psychoanalytic theories are reviewed rather meagerly, for instance, there is no reference to Freud's important contribution on the psychogenesis of female homosexuality.

The author's studies are based on material from Blackwell's Island, at the New York County Penitentiary for male prisoners and at the Women's Workhouse for women prisoners, about five hundred cases in all. Seventy-five of these are described in detail with their clinical histories and psychometric tests. It is pointed out that latent homosexuality is particularly apt to become active when groups of men with restricted liberties congregate together, but it is the sexual invert or pervert who lives in the community that is most apt to commit sexual crimes. The reviewer would emphasize that inverts or perverts are not responsible for their abnormal sexual acts, they are not 'degenerates' according to the popular viewpoint and should not be punished, or threatened with punishment, for their sexual abnormalities, as such procedures do not cure a homosexual. What the homosexual needs is not criticism but sympathetic understanding, and yet, at the same time, homosexuality should not be idealized, as it has been by some writers, because certain great men and women have been homosexuals.

According to the author, the only radical therapy for homosexuality is psychoanalysis but, even with this therapy, the prognosis should be guarded. He emphasizes that the average intelligence of the homosexual in penal institutions is somewhat higher than that of the non-homosexual inmates. However, the reviewer must point out that intelligence tests and intelligence quotients throw no light upon the total personality of the homosexual.

The volume deals with the methods of examination, which are important since the patient tries to conceal his homosexuality rather than to speak freely of it as he does in private psychiatric work, and with the various psychological, physical and sociological factors which appear to be most characteristic in the development of homosexual trends, and, even if it gives a limited insight into the psychogenesis of homosexuality, yet it provides a convenient working manual for those who have to deal with these particular problems in penal institutions.

A History of Women in Medicine From the earliest times to the beginning of the nineteenth century Kate Campbell Hurd Mead. 569 pp Haddam The Haddam Press, 1938 \$6.00

This book, like so much that has appeared in America in the last thirty years, is the direct result of the influence of William Osler. In 1890 the author was inspired by the programs of the Historical Club of the Johns Hopkins Hospital, and was much enlightened by the wit and erudition of Osler, Welch and Kelly. At that time she began a study of woman's place in the development of medicine. This was carried out intermittently from 1890 to 1925 in association with her active private practice. On her retirement, however, she began devoting long hours to actual historical research and for two years spent

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THE ETIOLOGY OF LUNG ABSCESS

A Clinical Analysis of 447 Cases Occurring at the Boston City Hospital
from 1926 to 1935, Inclusive

LOUIS M. FREEDMAN, M.D.*

BOSTON

THE etiology of lung abscess has become a matter of special concern to otolaryngologists, particularly because of the fact that tonsillectomy has been found to be the background of a large percentage of these cases in most of the large clinics. The literature is replete with such reports showing percentages varying from 10 to 40 per cent or more. Lord¹ in a series of 227 cases found that in 22 per cent the abscess developed as a sequel of tonsillectomy. Hedblom² in a total of 692 lung abscesses found 31 per cent to follow tonsillectomy. Schlueter and Weidlein,³ in a series of 1908 cases attributed 15 per cent to tonsillectomy. Pinchin and Morlock⁴ in England, show that 12 per cent of their 25 cases of lung abscess followed tonsillectomy. It is notable that, although the percentages vary considerably, in the series containing the largest number of abscesses the incidence of those following tonsillectomy is relatively low. Similarly Moore,⁵ in a questionnaire to otolaryngologists all over this country, gathered reports of 450,000 tonsillectomies, 202 of which were followed by lung abscess—a ratio of 1:2200. Crowe and Scarff,⁶ of the Mayo Clinic, recorded 3500 tonsillectomies, not one of which was followed by lung abscess. This is in agreement with Moore's finding that the larger the number of tonsillectomies performed, the smaller the percentage of lung abscess as a complication. Added to this fact is the outstanding one that most otolaryngologists encounter lung abscesses only occasionally. Apparently no attempt has been made to determine the incidence of lung abscess following operations on the upper respiratory tract, or to compare such a figure with that following other operative procedures or medical conditions such as pneumonia. Maxwell⁷ in a study of 315 autopsies following deaths from lung abscess at St. Bartholomew's and

the Royal Chest Hospital, in London, analyzed all the causes, and found a small number of lung abscesses following operations on the upper respiratory tract in comparison with all other causes (Table 1). Although this series represents only cases which failed to survive, the figures are of interest because they are very much the same as those found in the foreign literature covering the incidence of all types of lung abscess regardless of outcome.

This table shows how much more important a role pneumonia and abdominal operative procedures play in these cases than do operative conditions involving the upper respiratory tract. This being so, it seemed to me that a study of all lung abscesses, of both medical and surgical origin, occurring in a large clinic such as that of the Boston City Hospital over a ten-year period, would be of value in classifying this complication, and might produce some interesting and important data. This clinic has served the purpose especially well because it cares for a large clientele of indigent individuals who have little means for paying ward rates or professional fees. As a result, not only do patients with serious postoperative complications return to the hospital, but others operated on elsewhere come there for the treatment of long-drawn-out complications, which would otherwise be expensive.

The period from 1926 to 1935, inclusive, was chosen for this investigation. All lung-abscess cases were abstracted, studied and classified. Similarly, all the operative procedures carried out during this period were totaled, so that the ratio of operations to lung abscess could be determined.

A total of 447 cases in which the diagnosis of lung abscess was at any time made were abstracted, and all proved lung abscesses were selected for comparative study. X-ray pictures were examined, and histories and autopsy reports were studied

Read before a meeting of the New England Otolaryngological Society, Boston, November 16, 1937.

Surgeon-in-chief, Boston City Hospital and Beth Israel Hospital, Boston.

comparatively large numbers of pneumonia patients, because it takes up the discussion of the different types of pneumococci, their relative frequency in the pneumonias of adults and children, the varying clinical pictures produced by each type, and the results of serum treatment in the types for which a serum is available. The conclusions are drawn, for the most part, from the study of over 600 cases observed at the Harlem Hospital during the period from July 1, 1928 to June 30, 1936.

Besides the directions for the routine use of serum, there is a detailed discussion of lung taps, their use, and dangers in obtaining pneumococci for typing, agglutination tests and their value in determining whether sufficient serum has been given, the use of serum in hypersensitive reactions, oxygen therapy and the relative merits of different types of apparatus, the treatment of pulmonary edema, and a short section on the use of rabbit serum and sulfilamide.

The notes with interest that "our Harlem Hospital experience is not sufficient to establish statistically the value of serum therapy for Pn II." It seems a little strange that the author should have to combine his figures with those from the Boston City Hospital to find a significant difference in the death rate of the serum treated cases.

The author is in error when, in discussing the differential diagnosis of lobar pneumonia and pulmonary tuberculosis, he says, "A low blood count with a relative lymphocytosis suggests tuberculosis." Such a blood is that of active pulmonary tuberculosis, and not that of active tuberculous infection.

Good progress is being made in the management of pneumonia and any statistics are certain to lose some of their usefulness, but this book is the only work available which covers all of today's needs. Anyone seeing more than a few pneumonia cases will need this book for his treatment of patients in the next few months.

Step in Sex Education Edith Hale Swift 207 pp New York The Macmillan Company, 1938

This book, indirectly the result of problems arising in the author's own family, undertakes to show in a specific way how sex education of children between two and twelve can be successfully carried out at home. With the character of the teachings no one could quarrel with the method of presentation—that of dramatized conversation between father, mother, son and daughter—besides the fact that in a way it adds force, a little. The most effective sex teaching comes general response to the child's questions, but one wonders if Dr. Swift does not presuppose a greater knowledge of physiology, venereal disease, and the like, on the part of the parents, than the majority of them are likely to possess, even in this age of population. The conscientious parent will ground his child as well as possible in anticipation of the inevitable, then he will find this book as good as any to aid in the effective conveyance of the facts.

Diseases of the Hip Surgery and conservative treatment Fred H. Albee, assisted by Robert L. Pres. 8 pp New York Paul B. Hoeber, Inc., 1937

This book of three hundred pages concerning the diseases and diseases of the hip joint. It is very well illustrated by x-ray photographs and especially by the showing surgical technic.

The largest portion of the book is devoted to fractures of the hip and congenital dislocations. In the first group of cases the author emphasizes his own method of bone graft from the tibia, both in fresh and old fractures, although he does describe other methods. This makes it not a textbook but one in which the author's own technic is described.

The portion dealing with congenital dislocations emphasizes the operative technic that he uses in the so-called shelf operations.

It is a book for the orthopedic surgeon rather than the general practitioner.

Love and Happiness Intimate problems of the modern woman I. M. Hotep 235 pp New York and London Alfred A. Knopf, 1938 \$2.00

Modern woman, invested with a freedom never before accorded to her sex, is faced with new and pressing problems, particularly those centering about sex. To state some of these problems and to give reasons for and against one or another of the available solutions is the author's object in writing this book. Unnamed though he prefers to remain it is obvious that he is a man of wide experience, of liberal and independent thought, broadly tolerant of the biologic urges, and even the frailties, of humankind. And he writes very well indeed. Being eminently modern he does not hesitate to call a spade a spade, but there is not a trace of pornography in his discourse. It is a book which should help many women to a better insight of their personal problems. The only ones who will be offended are those who still adhere to the regulations of sexual conduct solely by authority.

Introduction to Ophthalmology Peter C. Kronfeld. 331 pp Springfield, Illinois, and Baltimore Charles C. Thomas, 1938 \$3.50

This book is designed as a second reader for students in ophthalmology. It contains no exposition of methods for ophthalmic examination, and no details for diagnosis or treatment.

Diseases and abnormalities of the eye are discussed in terms of pathogenesis, correlating the recent advances in fundamental sciences with clinical ophthalmology.

The text contains 331 pages, with 32 illustrations and 5 plates, all in black and white, and an adequate index.

It is a work to be studied with interest and profit by anyone who has completed a beginner's course in ophthalmology.

Essentials of Prescription Writing Cary Eggleston. Sixth edition, revised. 155 pp Philadelphia and London W. B. Saunders Company, 1938 \$1.50

This admirable book now appears in the sixth edition revised in conformity with the eleventh edition of the *U.S. Pharmacopoeia* and the sixth edition of the *National Formulary*. It is compact in matter and form, indispensable to the medical student and may be of no little help to many physicians in writing properly composed and accurate prescriptions. The section on Latin grammar might well be learned by anyone, although this reviewer agrees with the author that prescriptions to be filled in this country should be written in English.

While the apothecary's system of measure is in wide use and sanctioned by tradition in many of the older hospitals, the reviewer is also inclined to agree with the author that the metric system should be used.

victims of alcoholism. Unclean mouths and bad teeth and gums were present in nearly every case. Some patients had chronic lung trouble, such as bronchitis, asthma or bronchiectasis. All these conditions represented fertile soil for active lung infection. Supervening upon this and acting as a precipitating cause, were influenza and pneumonia. With the acute reaction incident to these infections, atelectasis to a smaller or larger extent took place, and the sequence of events was pneumonitis, necrosis and abscess formation.

The bacteriological findings in all these cases were not uniform. Anaerobes, streptococci, staphylococci, pneumococci, fusiform bacilli and spirochetes were present in various combinations. Even though an occasional case materially improved when arsphenamine was used, by and large this drug did not seem to affect materially the course of the disease. The claim that is sometimes made that spirochetes and fusiform bacilli are the important factors in the production of these abscesses was therefore not substantiated by our analysis. It would seem that this is not the only type of infection that is operative. The importance of the general condition of the patient, the virulence of the organisms, and the mechanical factors involved in atelectasis, which was probably present in a large percentage of the cases, cannot be overestimated in the production of abscess.

One is struck by the large number of cases following pneumonia or pneumonic processes. In this ten-year period there were 15,177 cases of pneumonia in the Boston City Hospital, and 104 cases of lung abscess following pneumonia, a ratio of 1:146. This complication was recognized by many earlier writers, among them Laennec,⁸ Zenker⁹ and Tuffier.¹⁰ In fact, lung abscess was considered a fairly frequent sequel to pneumonia. But as increasing attention was focused on lung abscess as a postoperative complication, particularly following tonsillectomy, pneumonia and general respiratory infection received less and less serious consideration as causes. A contributory factor was the realization that the pneumococcus was frequently not the only organism present. With the advent and the great spread of modern surgery came a tremendous increase in postoperative complications, as a result of which pneumonic conditions per se receded as a cause of lung abscess. The present survey, however, again reveals that a very large proportion of lung abscesses are still due to acute and chronic pneumonic processes, and in all probability outnumber those occurring as postoperative complications.

POSTOPERATIVE LUNG ABSCESS

We now come to a consideration of the lung abscesses which followed operative procedures. There

were 76 such cases in this series. In addition, 13 patients who had had tonsillectomies performed elsewhere were brought to the Boston City Hospital for the care of the pulmonary complications. These cannot be included in our figures in showing the relation between operative cases and ensuing lung abscess. Such cases are not unusual, because tonsillectomy patients usually leave the hospital within a day or two after the operation, whereas in almost all other cases the hospital stay averages ten days, during which lung abscess is likely to occur. It has therefore happened that the tonsillectomy was performed at one hospital and the postoperative complication was cared for at another. Furthermore, many patients with acute postoperative atelectasis, infarction, or pneumonia following abdominal operations die before a lung abscess can supervene. These cases also cannot be included in our figures, but offer food for serious speculation.

Table 4 Postoperative Lung Abscesses (76 cases)

OPERATIONS	
Tonsils and adenoids	16
Nose	2
Teeth	10
Hernia	4
Appendix	9
Kidney and bladder	3
Stomach	9
Gall bladder	9
Uterus and tubes	14
Total cases	76

Table 4 represents the distribution of our 76 cases of postoperative lung abscess. They were studied with the special purpose of finding, if possible, common factors as a background for the ensuing abscess. Most of these patients were in poor physical condition, the operations and anesthetics, except for the upper respiratory tract, were of long duration, and opportunities for complications were frequent.

The distribution of abscesses was greater for the right lung and lower lobes (Table 5), as was

Table 5 Location of Postoperative Lung Abscesses, Solitary and Multiple (76 cases)

RIGHT LUNG		LEFT LUNG	
Upper lobe	9	Upper lobe	6
Middle lobe	9	Middle lobe	0
Lower lobe	35	Lower lobe	20
Totals	53		26

found in the cases following pneumonia or infection of the nonoperative type. This distribution is important because it is most typical of abscesses of aspiratory origin. On the other hand, those who favor embolus as a cause point to the fact that in proved embolic cases also the abscess distribution favors the right lung and lower lobes.

The total numbers of the more common operations performed at the Boston City Hospital during the years 1926-1935, inclusive, are given in Table 6, together with the cases subsequently de-

The total of lung-abscess cases accepted for investigation was 276. These were then separated into those of postoperative origin and those with other causes, 196 cases were of medical origin, 76 occurred as a postoperative complication and 4 were a result of trauma.

Table 1 *Causal Conditions in Single Lung Abscess (199 cases), as Reported by Maxwell*

LESIONS OF THE RESPIRATORY TRACT	
Oropharynx.	
Operation for carcinoma of tongue	2
Tonsillectomy	2
Operation for carcinoma of tonsil	1
Larynx	
Operation for carcinoma	2
Trachea	
Tracheotomy	3
Bronchi	
Foreign body	2
Bronchiectasis	2
Carcinoma	32
Perforating carcinoma of esophagus	13
Lungs	
Lobar pneumonia	19
Bronchopneumonia	24
Actinomycosis	2
Suppuration of hydatid cyst	1
Secondary carcinoma	2
Chest	
Injury	2
Operation for empyema	2
ABDOMINAL LESIONS	
Subphrenic abscess (operation)	3
Perforated gastric and duodenal ulcer (operation)	7
Gastroenterostomy	6
Gastrectomy	1
Bleeding gastric ulcer (operation)	1
Cholecystectomy	3
Appendix abscess (operation)	4
Umbilical hernia (operation)	1
Strangulated hernia (operation)	1
Carcinoma of colon (operation)	3
Hysterectomy	1
Radium for carcinoma of cervix	1
Bladder and prostate (operation)	6
SEPTIC LESIONS ELSEWHERE:	
Cutaneous sepsis	4
Puerperal sepsis	4
Pneumococcal septicemia	1
Osteomyelitis	5
Septic arthritis	1
Otitis media	4
Lateral sinus thrombosis	3
Perinephric abscess	1
LESIONS OF THE CENTRAL NERVOUS SYSTEM	
Injury to skull or brain	3
Vascular lesion	1
Spinal injury	1
MISCELLANEOUS CAUSES	
Diabetes mellitus	2
Nonperforating carcinoma of esophagus	3
Liver abscess (doubtful cause)	1
CAUSE NOT EVIDENT	
Primary group	16

Table 2 represents all lung abscesses occurring in patients who had not been operated on. The 57 cases of chronic cough included bronchitis, asthma and bronchiectasis, and a number of factors, such as arteriosclerosis, cardiac disease and alcoholism, were involved. In these no definite history of pneumonia or influenza as a background could be elicited. Undoubtedly a fair percentage could have been traced back to the common cold, influenza or some acute process, with intervening atelectasis. In studying these abstracts it became

evident that in the latter half of the decade there was a gradual realization on the part of physicians of the role that pulmonary atelectasis plays in stagnation of infected material in shut-off portions of the lung.

Of the 196 cases of medical origin, 189 were

Table 2. *Lung Abscesses in 200 Unoperated Cases*

MEDICAL CAUSES		CONTRIBUTING CAUSES	
Pneumonia	104	Alcoholism	5
Acute abscess	59	Diabetes	5
Chronic abscess	45	Pleurisy and empyema	29
Chronic cough.	57	Syphilis	5
(Indefinite history a number of contributing factors)		Industrial (sandpaper work)	1
Influenza	15	Atelectasis in one or more lobes	17
Tuberculosis of lung	10	Cardiac disease and arteriosclerosis	11
Carcinoma of lung	3		
Carcinoma of tongue	1		
Subphrenic abscess	2		
Acute sepsis	4		
Total cases	196		
TRAUMATIC CAUSES			
Inhalation of foreign body			1
Accident and fracture of jaw and femur			3
Total cases			4

solitary abscesses involving one lobe of either lung, and 7 were multiple abscesses, including either abscesses in different lobes or more than one abscess in a single lobe (Table 3). From these

Table 3 *Location of Lung Abscesses of Medical Origin, Solitary and Multiple (196 cases)*

RIGHT LUNG		LEFT LUNG	
Upper lobe	38	Upper lobe	30
Middle lobe	19		
Lower lobe	75	Lower lobe	48
Totals	132		78

figures it is evident that the right lung and the lower lobes were more commonly affected than the left lung and the upper lobes. Almost all the abscesses following an acute process, with the exception of those due to acute sepsis and those following accident, were solitary. The multiple abscesses were those of chronic background. It is quite possible that there were more cases of multiple abscess than were diagnosed as such. Some of the cases which came to autopsy were found to have multiple abscesses, although during life these abscesses were diagnosed as solitary. For that reason the solitary and multiple abscesses were consolidated in one table, although only 7 cases of this series were proved to have multiple abscesses.

LUNG ABSCESS OF MEDICAL ORIGIN

Examination of all cases of lung abscess following medical conditions disclosed certain definite common factors.

A great number of these patients were in poor general condition. Some had diabetes, arteriosclerosis or cardiac disease, and a number were

cently we saw a patient who was prepared for tonsillectomy, which was not performed because of infection present in the lower respiratory tract. This patient developed a lung abscess, which would have been laid at the door of the tonsillectomy. We are convinced that the major source of lung abscess following tonsillectomy is the preoperative condition of the respiratory tract.

As to the type of anesthesia, lung abscess occurs when local anesthesia is used, but quite infrequently. Most clinics record a minimal percentage. It is true that abolition of the throat and laryngeal reflexes allows for the easy entrance of blood and septic material from the throat and tonsils into the trachea, but it does not follow that this in itself is sufficient to cause a pulmonary complication. Myerson¹¹ examined bronchoscopically 100 cases in which tonsillectomy was done under light general anesthesia, and found blood present in 76, even with the cough reflex present. He found that foreign material was evacuated from the lungs in twelve minutes, even under general anesthesia, in the absence of the cough reflex. The laryngeal reflex does not ensure the presence of cough. Patients will cough only when there is increased irritability in the respiratory tract, under light anesthesia. Iglauer¹² found blood in the trachea in 40 per cent of his patients under general anesthesia, and in 38 per cent under local. It is the prolonged retention of aspirated blood and septic material from the throat that helps to produce abscess.

Although Le Play¹³ in 1905, Grossard and Kaufmann¹⁴ and others, began to recognize post-tonsillectomy lung abscess as a distinct entity, it was Richardson¹⁵ who in 1913 first called serious attention to this condition. At the outset he favored embolism, later he became entirely convinced that aspiration was the most important factor. In 1916 Manges¹⁶ reported 9 cases in a single year, he thought they were all aspiratory in origin and blamed the upright position. Yanlauer¹⁷ thought that the gaping veins in the tonsillar fossas easily became thrombosed and caused septic infarcts in the lungs. From then on there were many reports from all over the country, until Moore³ in 1922 called attention to the occurrence of only 202 cases in his series of 450,000 tonsillectomies, a ratio of 1:2200. In all the reports local anesthesia held a very minor place, and general anesthesia was the background in an overwhelming percentage. The fact that most of these abscesses are related to the bronchial tubes rather than to the periphery of the lung distinctly favors aspiration as a cause. Furthermore, the fact that these abscesses occur most frequently in the right lung and in the lower lobes likewise favors aspiration, even though those who favor

embolism point to a similar distribution in cases of proved emboli. Bronchial obstruction is so frequent an occurrence that it is difficult to believe that aspiration is not the most natural mechanism of this condition. The work of Coryllos and Birnbaum¹⁸ on pulmonary atelectasis and the convincing evidence of Harkavy¹⁹ are most potent arguments in favor of aspiration, and atelectasis with retained septic material, as the background.

On the other hand, the experimental work of Fetterolf and Fox,²⁰ Cutler and Hunt,²¹ Cutler and Schlueter²² and others strongly favors embolism. Much experimental work has been done, being designed to reproduce lung abscesses in animals by aspiration and by embolism. Both methods have eventually proved successful. Much doubt has been cast on such experimentation because it has been impossible to be sure that its results were equally applicable to man. The differences in the animal tissues including the pulmonary circulation, together with the normally horizontal position of the trachea in animals as contrasted with the vertical position in man, throw doubt on the validity of these experiments. Moreover, chronic lung abscess has not been produced in animals, because of the tendency of the experimental abscesses to spontaneous healing.

While there is no doubt that lung abscesses occur as a result of aspiration and also by embolism, clinically the preponderance of opinion favors the aspiratory mechanism as the cause in the greater number of cases.

FOREIGN BODIES IN THE BRONCHIAL TUBES

It is striking that in the many foreign-body cases that come to our clinic each year there are not more resultant lung abscesses. This is due to a number of causes. Primarily, physicians and the community at large are more awake than formerly to the possibilities of danger from foreign bodies in the air passages. Likewise, clinics are far better equipped to handle these cases, so that early removal of the foreign body is commoner. Metallic or hard non-opaque bodies do not tend to cause abscess, and in the absence of degenerative substances or infection most of these cases clear up on removal of the foreign body before there is any chance that obstructive infection will occur. It is the vegetable or animal matter tending to cause inflammatory reaction with infection that is most prone to cause abscess. These cases also, when seen early, are likely to recover with adequate drainage as soon as the foreign substance is removed. In our clinic we have had to deal with 188 cases with foreign bodies during this period, only 1 was productive of a lung abscess. In that case, delay in coming to the clinic for

veloping lung abscess. More lung abscesses followed operation for removal of tonsils and adenoids than for any other operative procedure, but because of the large number of operations—twice that of any one of the others—the ratio of incidence (1/1654) was the lowest of all.

Table 6 *Total Number of Operations and of Subsequent Lung Abscesses at the Boston City Hospital (1926-1935, inclusive)*

	OPERATIONS	CASES OF LUNG ABSCESS	RATIO
Tonsils and adenoids	26 473	16	1/1654
Teeth	3 204	10	1/320
Appendix	12 702	9	1/1411
Stomach	486	9	1/54
Gall bladder	2 328	9	1/258
Uterus and tubes*	10 839	14	1/774

*Seven year period 1929-1935 inclusive

Table 7 gives the total number of cases of lung abscess developing after operations on the upper respiratory tract and after abdominal operations.

POST-TONSILLECTOMY ABSCESS

Of the 26,473 tonsillectomies and adenoidectomies performed, 17,705 were on children and 8768 on adults. Two abscesses followed those performed on children, and 14 followed those on adults. General anesthesia was used for all the children. Eighty-five adults were operated on under local anesthesia, and the rest under general anesthesia, none of the former developed lung abscess. The ratio of lung abscess to operation in the 26,473 cases was 1/1654—1/8852 in children and 1/626 in adults. There was much variation from year to year in this ratio. In 1935 there were no lung ab-

Table 7 *Postoperative Cases of Lung Abscess at the Boston City Hospital (1926-1935, inclusive)*

FOLLOWING OPERATIONS ON UPPER RESPIRATORY TRACT		FOLLOWING ABDOMINAL OPERATIONS	
Tonsils and adenoids	16	Hernia	4
Nose	2	Appendix	9
Teeth	10	Kidney and bladder	3
		Stomach	9
		Gall bladder	9
		Uterus and tubes	14
Totals	28		48

scesses and 4241 tonsillectomies. The last three years of the decade produced 5 lung abscesses, or a ratio to tonsillectomies of 1/2309. In the last five years there has been a greater realization of the need for careful observation, and as a result of more conscientious attention to preoperative condition and to methods of procedure, complications have been less frequent. Presumably because otolaryngologists always pay more personal attention to their private cases than they do to those in the hospital, the incidence of lung abscesses in such cases is low.

In our study of post-tonsillectomy lung abscesses, we examined the factors concerned in their production in the light of our experience with the

methods used in this institution. We divided these into *extrinsic* and *intrinsic* factors. The former we considered those which did not depend upon the patient or did not concern his general condition. These were operative position,—upright or Rose,—the use of suction during operation, and preoperative medication. All other factors, classed as *intrinsic*, included the patient's preoperative condition, the kind of anesthesia employed, operative trauma and bleeding, and aftercare.

Among the extrinsic factors, the operative position was considered first. All our tonsillectomies were performed with the patient in the upright position, and suction was generally used to keep the throat clear. Since only 1 lung abscess occurred in 1654 tonsillectomies, a figure which compares favorably with those of other clinics where the Rose operative position is used, it is difficult to believe that operative position was an important factor. Likewise, the use of suction, which some observers fear may cause more bleeding, and thus indirectly inhalation and an increased risk of thrombosis, is in the main a negligible factor, because if it were not, since it was frequently employed, we should have had many more abscesses than are shown in this investigation.

Preoperative medication in our cases certainly could not be considered a factor, because we used so little sedation. Medication for adults took the form of morphine and atropine. Children received either no medication, or small doses of atropine (1/500 or 1/250 gr.), according to age. Atropine has its proponents, who welcome the lessened secretion in the presence of ether which it causes, and opponents, who fear that although the secretion is lessened, its thickening is a source of danger. It is our experience that atropine is valuable in small dosage, especially when the anesthetic is ether, because it may help to prevent bronchial obstruction and atelectasis. We cannot believe that the viscid secretion it may possibly bring about is as likely to obstruct as is the greatly increased secretion produced by ether without atropine. We do know that in pneumonic processes, where there is considerable secretion present, small doses of atropine are distinctly helpful. The preponderance of opinion does not favor any medication that abolishes laryngeal reflexes.

In considering intrinsic factors, we realized how important was the preoperative condition of the patient. Tonsillectomy is an operation of choice, and is rarely to be considered an emergency. We are convinced that the most potent cause for pulmonary complication is infection already present in the upper or lower respiratory tract before operation. With lowered resistance, and the reactivation of an already present infection to virulence, the complication may be produced. Only re-

LUNG ABSCESS AND ITS RELATION TO SURGERY OF THE UPPER RESPIRATORY TRACT

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BOSTON

THERE are two modes of approach to the statistical study of lung abscess. The internist sees enough of this disease in the course of years to be profoundly impressed, not only by its seriousness but also by the fact that in many instances it follows some surgical procedure in the region of the mouth, nose or throat, and particularly tonsillectomy. The otolaryngologist, on the other hand, sees in this attitude a challenging implication with which he takes issue.

The otolaryngologist rarely if ever sees lung abscess as a complication in his operative cases. Furthermore, studies of large series of cases show an average incidence of 1 case of lung abscess in 2000 or 3000 cases of tonsillectomy.^{1, 2} Some writers, especially in England, have even found the incidence greater after general operations than after surgery on the respiratory tract. At this point, however, it should be stressed that the important factor is not the ratio of this complication to a given number of operations, of whatever kind, but the very serious fact that in any substantial group of lung-abscess cases, a large proportion occur after operation on the upper respiratory tract, and particularly after tonsillectomy.

The observation of Norris and Landis³ is pertinent to this matter. They say

Although the experience of any one operator, or even that of a large clinic, is limited, the number of cases of abscess following tonsillectomy is in the aggregate quite large. Statements of individual operators that they have never met with this sequel are of doubtful value, and this is especially true of large clinics where the patients are easily lost trace of. It is now known that many of these abscess cases never come to the knowledge of the operator. Some of them are recognized by another physician as abscesses only after months have elapsed.

In 1925, Lord⁴ reported 227 cases of lung abscess observed at the Massachusetts General Hospital between 1909 and 1924. Of these, 96 (42 per cent) followed some operative procedure, 78 (34 per cent) followed some operation on the upper respiratory tract, of which 21 (9 per cent) occurred after the extraction of teeth and 49 (22 per cent) after tonsillectomy, and the remaining 8 followed operation elsewhere. Aspiration of foreign bodies was responsible for 8 cases. There were 28 cases (12 per cent) in this series which were ascribed to

pneumonia. One case followed esophagoscopy, and in the rest the cause was not determined.

In 1934, King and Lord⁵ reported a second series of 210 cases of lung abscess, observed at the Massachusetts General Hospital between 1924 and 1932. While in Lord's earlier series, just mentioned, approximately 1 of every 3 cases could be traced to operations in or near the upper respiratory tract, the proportion in the second series rose to about 1 of every 2 cases (117 cases, or 56 per cent). The operative procedures included the removal of tonsils and adenoids in 81 cases (39 per cent), the extraction of teeth in 26 (12 per cent) and an upper respiratory operation in 10 (4.8 per cent), 19 (9.0 per cent) of the cases were due to other operations under a general anesthetic, making a total of 136 (65 per cent) referable to previous surgical procedures. The remaining cases were less clear, in 48 (23 per cent) the onset was insidious and the cause was undetermined, 17 (8 per cent) suggested pneumonia as a cause, 5 (2 per cent) followed an upper respiratory infection.

In the records of the Beth Israel Hospital there is to date a series of 66 cases of lung abscess. Of these, 34 (52 per cent) came after some surgical procedure, 31 (47 per cent) followed operations on the upper respiratory tract, of which 4 (5 per cent) were the extraction of teeth, and 26 (39 per cent) tonsillectomy. One case followed aspiration of a foreign body, 20 (30 per cent) pneumonia, and the rest miscellaneous conditions, such as the breaking down of carcinoma of the lung, bronchiectasis or some undetermined antecedent condition.

One significant conclusion must be drawn from these figures: surgery of the upper respiratory tract and pneumonia are responsible for most of the cases of lung abscess. The latter condition must be considered in the general problem of pneumonia control. Its incidence following operations on the upper respiratory tract, on the other hand, challenges the serious co-operation of the general practitioner, internist, otolaryngologist, oral surgeon and anesthetist. In fairness it must be admitted that the well-trained otolaryngologist rarely meets this complication. Nevertheless, if from a fifth to a third of all cases of lung abscess follow tonsillectomy, the profession, led by the otolaryngologist, must insist on a better general technic for this and kindred operations.

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removal of an inhaled veal bone, with consequent infection, was the causal factor

FACTORS IN CASES FOLLOWING ABDOMINAL OPERATION

In these cases the important factors are the condition of the patient, both before and during the operation, the anesthesia — predisposition to formation of much mucus and atelectasis, and the operative position — interference with lung ventilation, stagnation of secretions, and predisposition to atelectasis, the length of operation, the infective source, and the postoperative period

These factors are essentially the same as those which are operative in abscesses which follow medical conditions or operations on the upper respiratory tract. The condition of the patient is apparently always the most potent factor. The anesthesia and operation are both of longer duration, the dependent operative position maintained so long, causing interference with lung ventilation and consequent stagnation of secretions, adds to the possibility of atelectasis. Although infarction and embolism are stressed by many, there is much evidence that atelectasis and bronchial obstruction constitute the most frequent cause. Examination of our histories showed 1 possible infarct in a case of tonsillectomy, 1 of definite atelectasis following an appendix operation, 1 of infarct following a gall-bladder operation, 1 of infarct following an operation for gastric ulcer, 1 of infarct following a perineal operation, and 5 of infarct or embolus following gynecologic and obstetric operations. It is possible that there were more infarcts or embolic cases, but there was no evidence to prove their presence. It was only in the gynecologic and obstetric cases that infarct and embolism were prominent, as is the common experience. Most of the other cases more nearly approximated what one would expect to find in atelectatic bronchial obstruction. However, in spite of the fact that the distribution of emboli is often the same as in cases definitely aspiratory, it is reasonable to assume that the peripheral portions of the lung would be more frequently affected in infarction and embolism than those near the bronchi. Nevertheless, those cases with a definite infective source, such as a ruptured appendix or an empyema of the gall bladder, are the most likely ones to develop an infarction or embolus, even though we have been unable to find proof of this in individual cases.

SUMMARY

This investigation represents an analysis of all proved cases of lung abscess occurring at the Boston City Hospital in the years 1926 to 1935, inclusive. There were 196 cases of lung abscess following medical conditions, 4 cases following trauma and 76 cases following postoperative conditions, a total of 276 cases.

Although it has become the general belief that postoperative complications are predominating factors, this was not so in our cases. We believe that a careful investigation in other large clinics would produce results similar to ours. Tonsillectomy is a prominent cause in a large number of cases, largely because it is more frequently performed than any other operation. However, when compared to the total number of operations performed it represents a smaller percentage than is generally realized, and compares favorably not only with the incidence following pneumonia, but also with that following other postoperative conditions.

It is also evident that nearly all the cases of post tonsillectomy lung abscess occur in adult patients, and that they require more careful selection and preoperative care and better postoperative attention than heretofore recognized.

We believe that a more careful examination before all operative procedures and more careful post operative observation will considerably lessen the incidence of postoperative lung abscess.

475 Commonwealth Avenue.

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- 5 Pneumothorax. Often helpful
- 6 Thoracentesis when fluid is present, with histologic study of sediment.
- 7 Thoracoscopy. Limited usefulness
- 8 Needle punch biopsy. Often helpful.

Except for a careful history-taking and a thorough physical examination, x-ray is doubtless the most helpful diagnostic procedure. Unfortunately there are frequent complications which decrease its value. One of these is the presence of effusion in the pleura, which gives a homogeneous density without diagnostic detail.

A boy of eight (Case 1, Fig. 1) had persistent vague symptomatology and a pleural effusion preventing x-ray diagnosis. Removal of approximate-

Bronchoscopy in expert hands is quite harmless and is extremely helpful both in diagnosis and in therapy. In another patient (Case 3), however, diagnostic tissue from the bronchus was unobtainable until a second attempt had been made. Because of this, two other valuable methods of diagnosis were applied. Lipiodol was instilled for a bronchogram, which demonstrated the lesion to be fairly high in the lower lobe bronchus, and a thoracoscope was inserted through a trocar between the ribs for examination and biopsy of the irregular pleural surface. Histologic study of the tissue proved the tumor to be an adenocarcinoma.

Thoracoscopy, although limited in its usefulness,

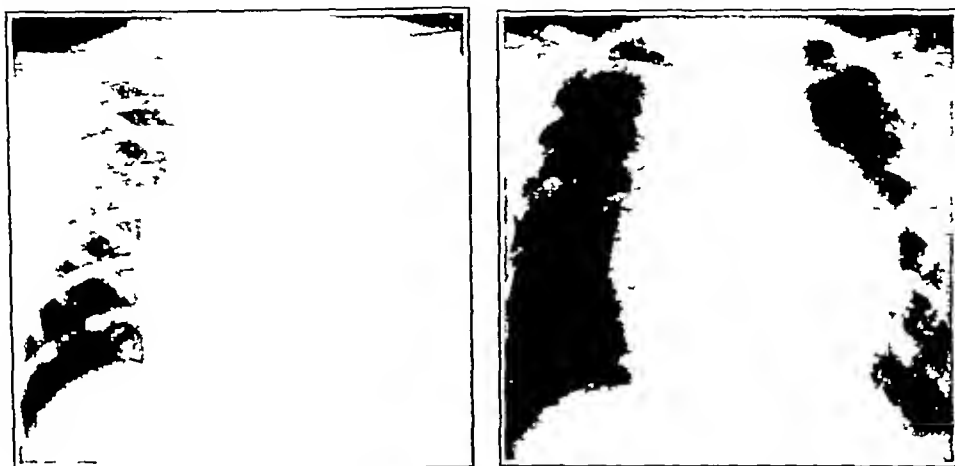


Figure 1. Case 1. Before and after removal of fluid and reinstallation of air demonstrating large mediastinal tumor.

ly 1600 cc. of fluid with instillation of air enabled the x-ray to reveal a large mediastinal tumor, which was proved at postmortem examination to be lymphosarcoma.

A man of fifty-one (Case 2) complained of cough and malaise for 1 year. Four months previously he had developed dyspnea, and effusion was found. The fluid obscured any underlying lesion, but when it was removed and replaced by air, a tumor of the left lower lobe was revealed, with some irregularity of the pleural surface indicating metastasis.

For either diagnosis or therapy large amounts of fluid can be removed at one sitting if one will equalize the intrathoracic pressure by injecting, almost simultaneously, equivalent amounts of air so that the lung is not rapidly expanded or the mediastinum rapidly shifted. The amount of fluid removed can exceed the amount of air re-injected by about 1000 cc. in the average adult. We have done this on many occasions and have so far seen no ill-effects, other than those which may follow the single insertion of a needle.

is particularly helpful in selected cases. A patient (Case 4) now in the hospital, entered complaining of cough and dyspnea and was found to have a large pleural effusion, when this was evacuated and replaced by air, there was revealed a large carcinomatous infiltration of the anterior wall and diaphragm, originating from a recurrent carcinoma of the right breast removed eight years before. This infiltration also was biopsied through the thoracoscope, since there was no endobronchial tumor to be obtained through the bronchoscope.

TUBERCULOSIS

Unless one can produce closure of cavities in tuberculosis, cure cannot be obtained. Although in many patients this result is achieved by sanatorium care, many others are not so fortunate. Sanatorium care alone is usually quite prolonged and expensive. The principle underlying the surgical attack on tuberculosis is closure of the cavity by the various methods of collapse therapy. Pneumothorax is the simplest and most popular method of producing such collapse, and there are very few

From the point of view of the prevention of lung abscess, several propositions stand out

- 1 Tonsillectomy and other operations on the nose and throat are major surgical procedures
- 2 Such operations should be performed in a

7 Finally, tonsillectomy should not be advised, particularly in adults, without clear and weighty indications. The surgeon and family physician must be sure that the operation is absolutely necessary

Table I *Antecedent Conditions to Lung Abscess*

AUTHORITY	NO OF CASES	FOLLOWING PNEUMONIA AND ACUTE RESPIRATORY INFECTIONS		OPERATIONS OF ALL KINDS		FOLLOWING SURGERY OPERATIONS ON UPPER RESPIRATORY TRACT		TONSILLECTOMY		EXTRACTION OF TEETH		ASPIRATION OF FOREIGN BODIES		MUCILLANOTIS	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
Lord 1909-1924	227	28	12.3	96	42.3	78	34.3	49	21.5	21	9.2	8	3.5	113	49.7
King and Lord 1924-1932	210	22	10.5	136	64.7	117	55.7	81	38.6	26	12.4	—	—	48	22.8
Beth Israel Hospital 1928-1937	66	20	30.3	34	51.5	31	47.0	26	39.4	4	6.0	1	1.5	11	16.6

hospital, and the cases should be carefully followed

3 Local anesthesia is preferable to general, but more important than the type of anesthesia is the qualification of the anesthetist

4 It goes without saying that the surgeon should be well qualified, and also that he should have his patient physically fit before the operation

5 It is well established that the danger of lung abscess after tonsillectomy is much greater in adults than it is in children

6 The extraction of teeth should be done in several sessions, obviating general anesthesia and too large a wound, and also minimizing the danger of foreign-body aspiration

This discussion merely re-emphasizes what has been taught over and over again. Reiteration, however, will have been justified if it leads in any measure to the prevention of a disease which is so often crippling and even fatal

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THE GENERAL PRACTITIONER AND THORACIC SURGERY

W EMORY BURNETT, M.D *

PHILADELPHIA

THORACIC surgery is developing so rapidly at the present time that almost monthly one hears of some new development making possible the control or cure of diseases previously considered unapproachable or inoperable. This branch of surgery is so recent that many physicians have not had the time or the opportunity to acquaint themselves with its accomplishments or possibilities.

It seems a very short time ago that 80 per cent of patients with advanced pulmonary tuberculosis died and 20 per cent recovered. Since the intelligent application of collapse therapy these percentages have been reversed. It is still difficult to convince physicians that surgical drainage of lung abscess will cure many of their patients if

done early enough to avoid the bronchiectasis which accompanies long-standing suppuration. There is work now afoot which, when evaluated, may prove that drainage within the first two or three weeks applied to all lung abscesses will greatly reduce the morbidity and the mortality of this serious disease. This branch of surgery has also made possible the cure of bronchiectasis, and is a possible modicum of control of carcinoma of the lung, though this is not yet proved. The demonstration of a few cases may illustrate some of the possibilities.

DIAGNOSTIC AIDS

Since diagnosis is so essential to proper treatment, a few words on some of its aids will be appropriate. They are as follows:

- 1 X ray. Extremely important and helpful.
- 2 Bronchoscopy. Extremely important.
- 3 Bronchoscopic biopsy when tumor is visible.
- 4 Sputum analysis. Important.

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EMPHYEMA

The increasing knowledge of intrathoracic physiology has contributed also to the treatment of empyema. By the older methods of wide and adequate drainage, as many as 30 per cent of simple empyemas may result in death when such wide-open drainage is applied early to a massive effusion, before stiffening of the mediastinum or adhesions of portions of the lung to the chest wall have occurred. Open drainage at this time destroys the negative pressure by which the lung is kept expanded and by which the two sides of the thorax are equalized in pressure. The result is

erations such as extensive thoracoplasties. Such large chronic cavities are practically unknown under this method. In addition, the illness is greatly shortened. It is thus possible to use this method on both sides at the same time, since the respiratory mechanism is continued at an increasingly excellent level. This patient (Case 9, Fig. 4) was so treated for bilateral empyema following bilateral pneumonia. He made an uneventful recovery in spite of the drainage on the two sides within five days of each other, and was discharged five weeks after the second drainage.

In a fair percentage of cases following such closed



A



B

Figure 3 Case 8 A Large cavity left upper lobe and ineffectual pneumothorax B Pneumothorax abandoned and the cavity closed by two-stage thoracoplasty

sudden and complete collapse of the affected side, with attendant dyspnea and anoxemia and movement of the mediastinum with each respiratory effort. This mediastinal flutter causes severe embarrassment to the heart, and we have seen such patients, recovering from their infection, die of the failure of an otherwise normal heart. If, on the other hand, a closed method of drainage is utilized, we maintain equilibrium between the two pleural spaces and a constantly expanding lung. This obviates mechanical difficulties arising immediately after operation, and the lung is pulled out to the chest wall as the pus is evacuated. It adheres shortly after contacting the parietal pleura, thus obliterating the pleural space, and prevents the formation of thick-walled chronic empyema cavities, which necessitate multiple deforming op-

erations, a pocket of loculated empyema results, necessitating a second operation. With such loculated cavities, the lung being adherent to the chest wall about the pocket, open drainage is safe and preferable. If the empyema when first seen is already loculated and fairly small, time is saved by immediate rib resection and open drainage, with the removal of the fibrin clot which is usually present. This was so in Case 10, the patient being discharged three weeks after drainage had been instituted. We consider aspiration valueless except for diagnostic purposes and the misconception, so prevalent in some communities, that repeated aspiration is a conservative and safe treatment of empyema has caused many deaths, countless complications or at best a great increase in morbidity.

who prefer other methods when pneumothorax can be performed. The following patient (Case 5, Fig 2) obtained excellent collapse and permanent cure even after re-expansion. Pneumothorax was begun four months after the onset of a rather acute illness, and was continued for seventeen months. The lung was then allowed to re-expand, and there was no evidence of continuing disease. The patient has been clinically well for about three years. How long such pneumothorax should be

If several adhesions are present in the region of the cavity, pneumothorax is often inadequate or unobtainable. Under such circumstances, paralysis of the phrenic nerve, which allows the diaphragm to ascend into the thorax, relieves the tension upon the lung, and may produce sufficient relaxation to allow closure of the cavity. Unfortunately this method is frequently ineffective, often produces considerable dyspnea, and interferes with effective expectoration. For these reasons thoracoplasty is

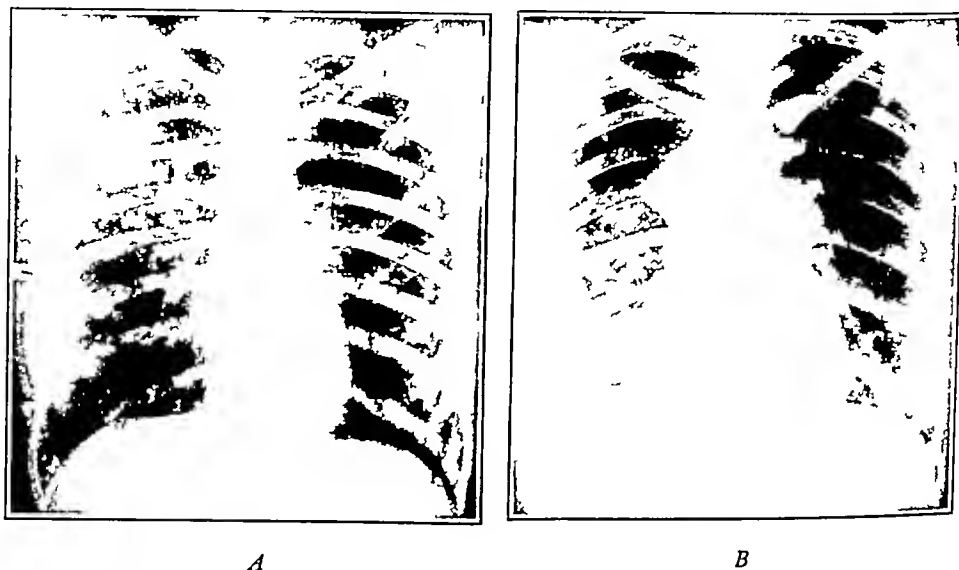


Figure 2. Case 5. *A* Before pneumothorax multiple cavitation of the right upper lobe. *B* Five months later, selective pneumothorax with complete collapse of right upper lobe and only partial collapse of right lower and middle lobes.

continued and whether it should ever be abandoned are controversial subjects. Certainly it should not be terminated in less than three years, and present opinion seems to favor continuing it as long as possible. Unfortunately, in many cases the pleural space is gradually obliterated by adhesions in spite of all efforts to maintain the pneumothorax.

Frequently pneumothorax can be only partially obtained because of adhesions from the chest wall to the lung around the cavity, which hold it open. If the cavity shows fairly thin walls and the adhesions are long and tenuous, they can be cut by thoracoscopic technic without opening the chest. The result of such intrapleural pneumolysis is illustrated by Case 6, that of a young woman who had had pneumothorax for nine months, with continued productive sputum and only moderate general improvement. Following severance of the adhesions there was rapid improvement, the sputum became negative within two weeks, and the cavity closed. Seven months later she was clinically well, showed no cavity and was going about her usual household duties, returning every two weeks for pneumothorax refills.

usually preferred. If phrenic surgery is attempted, it should be done as a temporary measure, and should consist in crushing the phrenic nerve, which will paralyze it for from three to nine months. If this procedure is ineffective or harmful, the paralysis is temporary, if, on the other hand, it is effective and too brief, the nerve can be removed at a subsequent operation in order to induce permanent phrenic paralysis. The patient in Case 7 was ill for one year and was unsuccessfully treated with pneumothorax. Her sputum was negative within two months after phrenic surgery, and she has been clinically well for four years.

As a rule, when pneumothorax is ineffectual, thoracoplasty, either partial or complete, is the procedure of choice, enough of each rib overlying the involved area should be removed to produce collapse of the chest wall sufficient to close completely the underlying cavities. This patient (Case 8, Fig 3) obtained such a result and a clinical cure six weeks after thoracoplasty. This was done in two stages, six ribs being removed and the function of the uninvolved lower portion being preserved.

patient has continued his usual activities in excellent health

Almost always if such drainage is delayed for several months, and occasionally even when it is instituted fairly early, there has been so much destruction of lung tissue and so much bronchiectasis that the lobe or even the whole lung is destroyed, and lobectomy or pneumonectomy is the only possible means of cure

BRONCHIECTASIS

At any age, chronic cough, with profuse expectoration and physical signs of moisture in certain parts of the bronchial tree, with or without

tion later in life leaves the patient with typical bronchiectatic symptoms. Many other cases develop from continued respiratory infection, such as a chronic sinusitis or even tuberculosis. Any condition producing prolonged lavage of the bronchi by purulent material may induce bronchiectasis

Although we have never seen a patient with this disease permanently cured by any means other than surgery, occasionally for fairly long periods such cases may be made symptom-free by bronchoscopy, postural drainage, supportive measures, vaccines and so forth. Nearly always, however, the next respiratory infection brings a recurrence of the

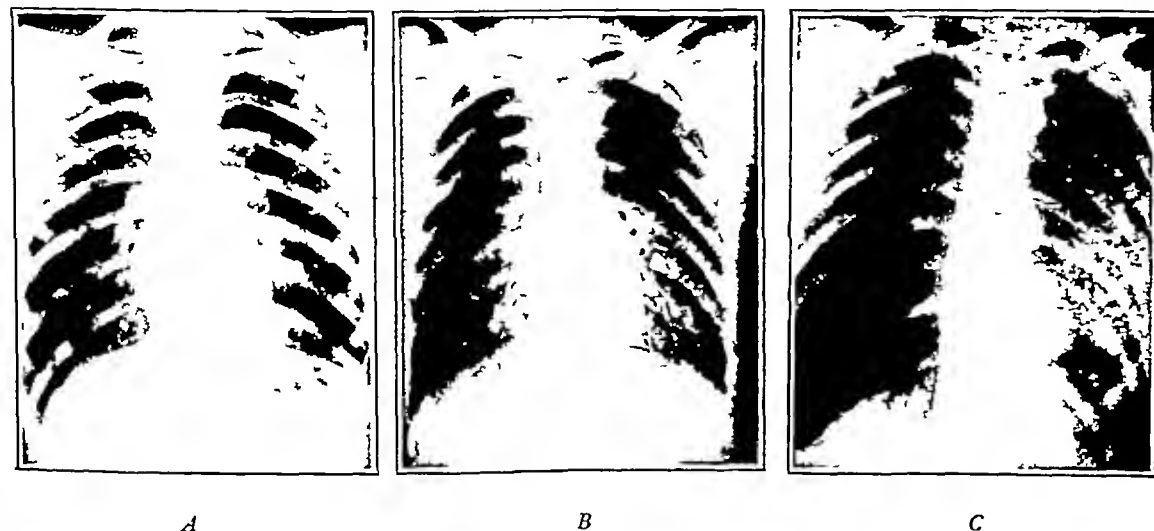


Figure 5 Case 13 A Some increase in peribronchial density, but insufficient to diagnose bronchiectasis B Explanation by lipiodol instillation C Eleven weeks after left lower lobectomy under local anesthesia Lipiodol reveals a normal bronchial outline in an emphysematous left upper lobe and the stump of the left lower lobe bronchus filled with lipiodol

hemoptysis, fever, toxemia or signs of complications, are frequently caused by bronchiectasis or tuberculosis. Such patients often reveal no physical signs of consolidation, and even x-ray, unaided, may not suffice to show the true condition. Without the assistance of opaque material, such as lipiodol, to delineate the size and shape of the bronchi, the diagnosis will often be missed. In Case 13 (Fig 5), one sees few abnormalities in the first film, and no more were shown until the lipiodol was instilled. This is mainly because the area which might have shown induration is obscured by the cardiac silhouette. The etiologic factor in this case was a tonsillectomy done four years previously, but many such cases are congenital, and show no symptoms until some respiratory infec-

tion later in life leaves the patient with typical bronchiectatic symptoms. Many other cases develop from continued respiratory infection, such as a chronic sinusitis or even tuberculosis. Any condition producing prolonged lavage of the bronchi by purulent material may induce bronchiectasis

BRONCHIOGENIC CARCINOMA

The supposedly rare condition of bronchiogenic carcinoma of the lung is found upon study of both postmortem and hospital admission statistics to occur in approximately 10 per cent of all cases of carcinoma. It therefore behooves us to keep it constantly in mind, especially since the symptoms

LUNG ABSCESS

Although the percentage of lung abscesses among the patients of any one doctor or hospital is small, the lesion is important because of its serious character and the high probability that it will become chronic and extremely debilitating, if not fatal.

In spite of experimental evidence to the contrary, the majority of lung abscesses appear to be due to various forms of aspiration of infectious or irritating material. Consider the patient who, under general anesthesia, inspires vomitus, blood, pus,

it is effected by means of a large opening which furnishes adequate drainage, the patient has a good resistance to the infecting organisms, and there is a complete liquefaction of the destroyed tissue. These conditions are conducive to spontaneous recovery, which occurs in approximately one third of all cases. In Case 11, the patient showed definite improvement in two weeks and a complete cure in six weeks from the time the abscess was discovered. If there is no definite improvement in two months from the time of dis-



Figure 4 Case 9 Before and three weeks after simultaneous drainage of bilateral empyema

tissue or some other foreign body while the protective cough reflex is abolished. Other sources of unconsciousness, such as drunkenness, trauma, drugs and even, rarely, natural sleep may permit aspiration similar to that under anesthesia. Following any such a period of unconsciousness we may have the onset of cough, fever and pain in the chest, with physical signs of consolidation, followed in two or three weeks by the profuse production of foul-smelling sputum as the abscess breaks into a bronchus.

Other etiologic factors fairly commonly observed are respiratory infection, such as bronchitis or pneumonia, which fails to clear up, infected emboli from other sources, which occasionally lodge in the vessels of the lung and start an abscess about them, and, rarely, trauma such as that caused by a gunshot or stab wound.

In any case, the great majority of patients presenting this picture fall into three main classes (1) When evacuation into the bronchus occurs,

covery, further delay in obtaining drainage by surgery seriously jeopardizes the patient's chances for recovery, for spontaneous cure is almost never obtained, and a constant absorption of toxic material causes progressive debilitation, while the lesion frequently spreads to adjacent parts of the lung because of recurrent temporary blockage of the drainage aperture. (2) Bronchoscopic aspiration and postural drainage, combined with blood transfusions and other supportive measures, may increase the percentage of nonsurgical cures from 30 to 40 or 45. (3) Of the remaining 60 or 55 per cent of these chronic and long standing abscesses, adequate surgical drainage may cure an additional 20 or 25 per cent. An example of the excellent response to drainage is furnished by Case 12, in which surgery was not postponed too long. The patient was completely well in ten weeks, although he had been ill for five months before drainage. A film taken one year later showed no evidence of recurrence, and the

THE CLASSIFICATION AND TREATMENT OF ARTHRITIS

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THE two most important factors underlying the confused state of mind of the medical profession in regard to arthritis are first, the lack of a universally understandable etiologic classification, and secondly, a failure to understand the pathologic process which goes on in the joint tissues in response to irritation. If a classification based on the pathologic processes in the joints gave any adequate idea of the processes themselves, it would serve admirably and the confused state of mind would cease to exist. The fact that arthritis is so poorly understood, even at the present time, is convincing evidence that pathologic classifications have failed. The etiologic classification here presented has been used in instructing nurses and medical students concerning arthritis, with a resultant grasp of the subject which is most encouraging, considering the difficulty experienced with the prevailing classifications.

This classification is based on the theory that there are three basic etiologic factors in arthritis: bacteria, toxins and trauma. It is well known that bacteria may exert their deleterious effects upon tissues in two ways: first, by invasion of the joint tissues, and secondly, by the poisonous effects of the products of bacterial metabolism. The latter does not require the presence of the bacteria in the joint tissues, and the source of production of the poisons—the focus of infection—may be in a distant part of the body. If the bacteria are present in the joint tissues, both bacteria and the products of their metabolism operate, but the effects of the former are so much more severe than those of the latter that the latter are submerged.

The very fact that no distinction is made between direct invasion and poisoning by bacterial products constitutes a predominant source of confusion in the understanding of arthritis, and the principal bar to proper treatment. The effects cannot be the same. The presence of bacteria in the joint tissues calls forth the white blood cells, principally the polymorphonuclears, to combat the invasion. The proteolytic enzymes elaborated by these cells bring about the liquefaction of tissues, which are destroyed in the inflammatory process. The destructive action in infection is in inverse proportion to the intimacy of blood supply to the tissues and in direct proportion to its lack. The articular cartilage, having a very feeble blood supply, has little if any defense against the destructive action of the proteolytic enzymes and is an easy prey. Bac-

terial poisons, on the other hand, call out very little polymorphonuclear reaction, and the tendency to destructive liquefaction of the cartilage is consequently less.

Thus, destructive action on the cartilage—the essential joint tissue—and its inability to regenerate are fatal to the joint as a moving mechanism. Between the extremes of virulent bacterial invasion and bacterial toxic damage are gradations of joint damage depending upon the polymorphonuclear reaction developed. In the classification here presented, "infectious" has been made one of the main headings, this group has been subdivided into "bacterial" and "toxic," so as to recognize the production of joint damage by direct bacterial reaction and by the toxic action of bacterial products.

In bacterial arthritis, a focus of infection in another part of the body is of minor importance, since the establishment of the bacteria in the joint tissues constitutes an autonomous focus. Knowledge that the bacteria have invaded the joint is therefore of major importance, as is recognition of the particular organism and its characteristics. In toxic arthritis with an infectious basis—the focal-infection type—it is necessary to locate the focus of infection in order to recognize the organism. Elimination of the focus will contribute much to improving the condition, but the degree of improvement and the period of time necessary for it to take place depend upon how long changes in the joints had existed before the focus was removed, and the care of the joints during the active infection. Furthermore, discovery of a focus of infection does not necessarily mean that it is the sole or even partial cause of the arthritis.

It often happens that the focus is so located that it cannot be eliminated, and to minimize the effects of this infection will often tax one's ingenuity. The question may also be raised in so-called focal infection whether foci are the causes of the joint affection, or merely manifestations of a lowered resistance to infection. Even when improvement in the joints soon follows elimination of a focus, the latter is not necessarily the cause of the arthritis, since it may well be considered an overload on the body economy, the removal of which placed the body mechanism in a better position to combat the joint condition.

All arthritis is not caused by infection, and all toxins are not the product of bacterial action. In order to include those causes which do not arise

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of the early stage are extremely vague. The only constant symptom is that of mild cough, which is usually disregarded by the patient and even by the physician. Thus it appears essential that wherever a persistent cough, especially in a person above thirty-five, does not respond to active treatment, the case be investigated to the limit of our diagnostic ability before carcinoma is excluded.

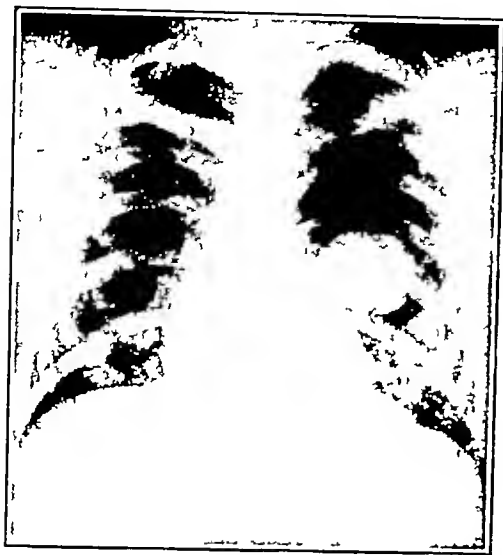


Figure 6 Case 14 A medium sized tumor of left upper lobe revealed following a diagnostic pneumothorax

Hemoptysis from ulceration of the tumor also may occur fairly early. However, atelectasis, pain in the chest and pleural effusion, any one of which may cause the patient to seek aid, usually indicate an advanced involvement, and such cases often prove inoperable. Frequently it is impossible to know the operability of such a lesion without thoracic exploration. We have explored 9 such cases and found only 1 operable. This patient (Case 14, Fig 6) was only twenty-seven, and was

first thought by his physician to have a bronchiogenic spread of tuberculosis from a peribronchial lymph node. Thus considerable time was wasted, and the very cellular cancer grew rapidly until lobectomy was performed, seven months after the first complaint of cough and hemoptysis. The patient made an uneventful recovery from the lobectomy, but because of our mistaken conservatism in removing only the involved lobe and not the entire lung and mediastinal lymph nodes, he returned in four months with recurrence in the lower lobe at the hilus of the removed upper lobe. A second attempt was made to complete the pneumonectomy and remove the tumor, but it was so soft, rapidly growing and extensive that the operation had to be abandoned. He was treated by heavy doses of x-ray therapy without effect, and the patient died eighteen months later.

In spite of the marvelous results obtained by x-ray in many carcinomatous lesions, no proved case of bronchiogenic carcinoma has ever been cured by this method, and as a rule the effect upon the tumor is so slight that it does not compensate for the sickness which so frequently accompanies heavy dosage. The only benefit we have seen has been that of the abolition or decrease of pain.

Although it is too early to evaluate the results from surgery, several articles by Graham, Sauerbruch, Churchill, Edwards, Allen and Smith, Overholt and Rienhoff report upward of a dozen cases alive and apparently well for more than six months. Two of these have been observed for three years after operation, 3 for two years and 2 for one year. Thus one can visualize the probability that earlier diagnosis made by alert physicians, who will urge radical surgery upon such patients as their only hope of cure, may eventuate in a measure of control of bronchiogenic carcinoma similar to that of cancer in other parts of the body.

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tious since the symptoms and signs are those of infection and the trauma is incidental. After an infectious lesion has occurred in a joint without obvious damage, the mechanism of the joint is often sufficiently disturbed so that with ordinary use changes will arise which must be classified as traumatic. The presence of toxic factors in the body in conjunction with the abnormal use of a joint results in earlier or more pronounced changes of a traumatic nature, and the condition is to be accordingly classified.

A classification is not a substitute for reasoning, it is a logical and convenient arrangement based upon knowledge of the subject, and as such is presented in Table 1

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Arthritis, whether it be acute or chronic, is a painful disease. It interferes with, if it does not prevent, normal activity of the body, and it constitutes a threat to joint motion. For these reasons it requires positive and intelligent treatment, which in turn demands a complete understanding of the factors behind the arthritic process.

As stated above, there are three principal foes to normal joint function: bacteria, poisons and trauma. While any one of these may act alone to produce joint lesions, it is more likely that two or even all three will act in a given case. All the possible combinations of these three factors cannot be considered in a short article, and it is doubtful whether even a fair-sized volume could cover the large number of ways in which the three may interact. We shall discuss the treatment of the pure arthritic types, but the practitioner must combine with these conclusions his study of the individual case.

BACTERIAL ARTHRITIS

The indefinite term "infectious arthritis" has come to convey different impressions to different people. The term "bacterial arthritis" is used here to denote any arthritis caused by invasion of the joint structures by bacteria. How is bacterial invasion to be determined? For the time being, only recovery of the bacteria from the joints affected can be considered scientific proof, although clinical judgment may at times determine the matter without resort to identification of the organism. If the organism be the tubercle bacillus, the treatment must be limited to what the patient is willing to accept. At present, permanent control of the tuberculous process is possible only through the destruction of the joint. Retention of varying amounts of joint function with subsidence of the tuberculosis is possible, but the reactivation of the tuberculous process is a constant threat.

Luetic arthritis, like syphilis in any part of the

body, is susceptible to general treatment by specific drugs, but the time element here is as important as in any invasion of the joint, that is, procrastination may result in permanent joint damage even though the luetic process is eventually brought under control by antiluetic drugs.

For practical purposes, all the pus-producing organisms can be considered in a group. Invasion of a joint by any one of them may result in an inflammatory reaction, varying from a serous joint effusion to a fulminating purulent one. Destruction of cartilage, the tissue peculiar to the integrity of the joint, is accomplished by the proteolytic enzymes elaborated by pus cells. The number of pus cells present, determining as it does the concentration of enzymes, is an important indication of the degree of danger to the cartilage. Three stages of severity are recognized: serous, seropurulent and purulent types.

In the *serous* type the invading organism calls forth little cellular response and the joint fluid contains a relatively small number of pus cells. There is relatively little danger of marked destruction of the cartilage. Clinically, there is only a slight rise of temperature, and the white-cell count and polymorphonuclear percentage of the blood are only moderately increased. Surgery is seldom necessary. A well-molded plaster cast, and measures aimed at building up quickly the patient's resistance, are usually sufficient to turn the tide. Even in this mild type of arthritis a close watch must be maintained to see that the condition does not develop into either of the more serious types. The temperature trend and the white-cell count and polymorphonuclear percentage must be watched closely.

In the *seropurulent* type, the number of pus cells in the joint effusion is sufficient to give it a thin, purulent character. With such a concentration of cells, one must be prepared for radical surgery, and resort to it without hesitation if the temperature trend is unfavorable and the white-cell count and the polymorphonuclear percentage tend to rise. The seropurulent type does not always require surgical measures, but until one has had considerable experience, the surgical approach is probably the safest for the preservation of the cartilage. It must always be borne in mind that the serous and seropurulent types may be early stages in the highly dangerous purulent type, but that the process may stop before reaching the last-named stage.

The *purulent* type invariably represents a fulminating infection or a late recognition of a joint invasion. The patient's life is endangered, and the damage to the joint cartilage is of secondary consideration. Treatment aimed at saving the patient

from infections, and to devalue the overwhelming importance which has been ascribed to infection since the promulgation of the theory of focal infection, the other main heading in this classification has been designated as "noninfectious." The principal subdivision under this heading is "toxic." This term is a logical and desirable one. Under it can be placed the many diverse and seemingly unrelated causes of arthritis which are gaining adherents with the development of our knowledge concerning the abnormal actions of various glands in the body, and with the discovery of the effects on the body of poisons originating outside it. Since this classification, if it finds favor, must serve in the investigation of arthritis as well as act as a convenient clinical guide, the term "toxic" requires further subdivision, according to whether the toxins arise within or outside the body. The term "endogenous" includes those conditions other than infection which within the body give rise to toxic products. The terms "allergic," "metabolic," "climacteric" and many others which have no logical place in any existing classification may be readily placed in this division as "glandular dysfunction" or "intestinal dysfunction," without doing violence to our classification.

"Exogenous" poisons include those arising outside the body but taken into it accidentally,—through environment or industrial exposure,—or intentionally,—as food or medicine,—without knowledge of their poisonous effects on the joints. Arthritis and arthritic symptoms are not always primary, but may be secondary to disturbance of the muscular control of the joints from various causes. If the cause of the disturbance be unknown, the latter would be considered the etiologic factor, and the joint condition is to be classified under the second subheading "noninfectious, traumatic," the subclassifications of which will be discussed later. But if the cause is known to be chronic lead poisoning, for instance, the arthritis is to be classified under "noninfectious, toxic."

Trauma, the third important etiologic factor, finds a logical place under the heading "noninfectious." All joints are not equally subject to trauma, but that trauma is a cause of arthritis needs no demonstration. It is rather the definition of just what constitutes trauma that requires explanation. The joints suffer trauma in their ordinary use. Without any specific trauma, the joints after many years show certain changes which are designated as hypertrophic arthritis. Certain factors tend to bring these changes about at an earlier age than they would ordinarily occur. Just when they are to be considered normal and when pathologic cannot be stated here, but the age of the person affected and the extent of their development determine their abnormality.

Habitual variations from the normal physiologic posture continued over a long period—faulty posture—result in strain of the joint structures, giving rise to changes and symptoms before they would normally be expected. Such trauma is classified as "physiologic." If, in the performance of a particular occupation, one or several joints are brought into use repeatedly many times a day for a long period, the joints so used will show a greater development of abnormal changes than others. This type of trauma is designated as "occupational." If, as the result of a violent injury to the structures about a joint, its normal relations are disturbed, the eventual changes and symptoms are designated as "accidental."

For ordinary clinical use, the classification as outlined is no doubt too detailed. By judicious elimination and consolidation, it can be reduced to the three essential etiologic factors from which we started.

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Etc		
Toxic		
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Tonsils	<i>Streptococcus viridans</i>	
Sinuses	<i>Staphylococcus</i>	
Prostate	<i>Pneumococcus</i>	
Gall bladder	Etc	
Etc		
NON-INFECTION		
Toxic		
Endogenous		
Intestinal dysfunction		
Glandular dysfunction		
Exogenous		
Foods		
Medicaments		
Arsenic		
Lead		
Radium		
Biologic Materials		
Serums		
Insulin		
Industrial poisons		
TRAUMATIC		
Physiologic		
Occupational		
Accidental		
Simplification of Etiologic Classification		
INFECTION		
Bacterial	—————	BACTERIAL
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Prostate	<i>Pneumococcus</i>	
Gall bladder	Etc	
Etc		
NONINFECTION		
Toxic		
Endogenous		
	Intestinal dysfunction	
	Glandular dysfunction	
Exogenous		
	Foods	
	Medicaments	
	Arsenic	
	Lead	
	Radium	
	Biologic Materials	
	Serums	
	Insulin	
	Industrial poisons	
TRAUMATIC		
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ly toward internal glandular factors as included in the etiology of ankylosing arthritis of the spine.

Diet Faulty nutrition, whether arising from poverty, ignorance of proper diet, faulty metabolism or unwisely attempted control of body weight, is a bar to recovery from arthritis, and in some cases may well be considered a cause of it. All too often, restricted diets as part of the treatment of arthritis aggravate the disease which they are intended to relieve.

Fatigue Either mental or physical fatigue must not be permitted. It is often one of the symptoms in toxic arthritis, and calls for complete rest until it disappears.

Exogenous Poisons These may be classified according to their method of ingress, or according to their origin. The latter classification will be used here. We are not so much concerned with acute, spectacular poisoning, which is seldom a factor in the causation of arthritis, as with slow, insidious poisoning recognized by its remote results rather than by its alarming symptoms.

Diets, or special groups of foods, have always been a favorite method for the treatment of arthritis, and never more so than at the present time. It seems as though every possible combination of food had been recommended for the arthritic, on the other hand, all classes and many individual foods have been banned as inimical to his welfare. Foods vary in digestibility, in their bulk or lack of bulk, and in their nutritive value, but they are all foods. The reaction of the body to them varies, and when a food causes a skin eruption, diarrhea, nausea or any other untoward symptom it is a poison to the body. It is called an "allergic substance" and the reaction is called "allergy." The term "allergic arthritis" has found some acceptance but should be shunned because by derivation it explains why something is poisonous instead of naming the cause. The fact that a given food is poisonous to an arthritic patient is sufficient reason to exclude it from his diet. It is not always possible to show a direct connection between the food poison and the arthritic symptoms, nor is this essential, since the poison concerns us as a factor unfavorable to recovery rather than as a cause. Tomatoes, strawberries, certain shellfish and various meats are not tolerated by certain individuals. It therefore devolves upon the physician to check carefully the patient's reaction to the various classes of foods, and to certain foods in particular.

Drugs which include an ever-widening list of chemical substances and compounds, must have the same close scrutiny as must foods. The pa-

tient is not so apt to sense the relation of medicine to dysfunction as he does that of foods. Insulin, not properly a drug but a biologic product, has been known to cause secondary arthritis.

In *industrial poisons* we again have a group of substances in which the relation to illness is not immediately apparent. The individual may come into contact with the substance in industry or through use of a manufactured product containing it. Lead has been found to be a cause of arthritis, as have arsenic and radium.

Restoration of Normal Physiology

While this second objective in the treatment of toxic arthritis must sometimes await removal of the unfavorable factors, in many cases restoration of the various disturbed functions of the body cannot be begun too early. Reliance upon the well-known tendency of the body to resume its normal state after the elimination of disturbing elements has caused many failures in the treatment of chronic diseases. The toxic arthritic is invariably subnormal in weight, and a trend toward normal is one of the best indications of his improvement. "Chronic indigestion" and "dyspepsia" are often but the outward manifestations of a subnormally functioning digestive system. At the beginning of treatment, the patient cannot copy the diet of the normal person, either as to quality or as to quantity. Small, frequent, highly nutritious and easily digestible meals should be the rule, with a gradual return to normal food habits. In patients who are overweight, restriction of carbohydrates is generally recommended.

Elimination through the intestinal organs suffers with the disturbances of the gastric organs and the limitation of general activity. The proper method for such elimination varies with each case. Abdominal massage and colonic irrigation are used in patients with intestinal organs severely deranged, but these must be looked upon as emergency measures, to be dispensed with in favor of milder means at the earliest possible time. The proper selection of cathartics and laxatives is difficult in the face of the glowing promises made for an increasing number of advertised preparations. The physician should familiarize himself with a few good laxatives, and stick to them.

Exercise is extremely important and is, incidentally, a step toward the return to normal bowel habits. The skeletal muscular system of the body, as well as the muscle of many vital internal organs, loses tone and strength in a chronic illness imposing long inactivity. Restoration can come only from careful and systematic training and the physician could profitably imitate the athletic trainer in his efforts toward their end. Appropriate exer-

serves also to preserve the cartilage. The evacuation of the pus in the joint is essential.

Before undertaking the surgery of infected joints one should study the anatomy of the surrounding structures in order that good drainage, with minimal structural damage and maximal conservation of future function, may be attained. True joint invasions are essentially acute and self-limiting. A distinction should be made between an actively infected joint and one damaged by infection. The end result of infection may be ankylosis by bone or by fibrous tissue, or motion of varying degrees with a mechanically imperfect joint.

TOXIC ARTHRITIS

Arthritis due to poisons may be acute or chronic. The poisons, or toxins, may arise from bacterial invasion in other parts of the body, that is, focal infections, from nonbacterial sources within the body, that is, intestinal and glandular dysfunctions, or from without the body, that is, from foods, drugs, biological preparations or industrial poisons. Arthritis arising from these causes supplies a large group of poorly understood and, so, poorly treated cases. The disease may be primary, directly affecting the joint, or secondary, through disturbance of joint control by the muscles. Because these poisons are general in their action, the affection of the joint may be one manifestation of the toxic effects, or it may be the result of disturbances to other body functions. While the joint must be protected during the activity of the disease process, so as to conserve its function against the time when the disease process will no longer be active, treatment of the disease itself is a problem of internal medicine, and a complicated one.

It would be of small value to describe specific measures of treatment. Each physician has his favorite preparations which seem in his hands to give the most satisfactory results. It is more important to understand the main objectives of treatment, in the order of their importance.

Elimination of Unfavorable Factors

Unfavorable factors may be etiologic elements, and should therefore be eliminated. But even though they are not causative, if they are unfavorable to the body economy they are hindrances to the return of the body to normal, and must be either done away with or minimized as the first step in treatment.

Focal Infection This is unquestionably an important factor, and one which has received much attention—to the detriment of other factors—since the theory of focal infection was advanced. In a very narrow sense it has been looked upon as the one element which must be found in every case of arthritis. Infection in the teeth

and tonsils, because of their easy accessibility, has resulted in their promiscuous removal, often without sound reasons. Infection in the sinuses, the gall bladder, the prostate and the salpingian tubes has received some consideration, but because of the greater difficulty in obliterating them, these organs have failed to become recognized as causes of arthritis. However, these and many other active infections in the body, such as pulmonary tuberculosis and chronic cystitis, may be unfavorable focal infections, treatment of which is necessary if the arthritic process is to be brought under control.

Intestinal Dysfunction It is of course possible to have a focus of infection in the intestinal tract, such as colitis, which can and does cause arthritis, but even without definite infection, faulty functioning of the intestinal tract may be an unfavorable or even a causative factor in toxic arthritis. The end products of digestion may be thought of as having a normal consistence. If those products are retained in the colon beyond a reasonable time, the consistence increases, indicating that some of the fluid has been absorbed. It does not seem likely that the fluid is absorbed as distilled water, nor that only beneficial products are contained in the solution absorbed. It goes without saying that provision has been made within the body for the removal of deleterious substances absorbed from the intestinal tract, but the detoxicating agency may be operating in a faulty manner. Granting such a train of events, it is not difficult to understand how the intestinal tract may be an unfavorable factor.

Glandular Dysfunction The glands of internal secretion have profound effects on all body functions. In our present state of knowledge concerning these glands, one can only say that glandular imbalance, in the form either of an excess or a deficiency, may vitally affect the body mechanism, in a way which we as yet understand only imperfectly, in spite of the startling discoveries of the last ten years. When the internal glandular functions and their effects are more clearly understood, we shall be able to treat some types of toxic arthritis more effectively. Today it is known that the exhausted patient with hyperthyroid disease and the lethargic and overweight hypothyroid individual may both suffer from joint difficulty; the basic answer in either case is regulation of the thyroid function. The coincidence of joint difficulty at onset with the natural or artificial production of the menopause is so well recognized that the term "climacteric arthritis" has been used to describe the condition, and ovarian substance has been found beneficial. Some evidence points clear-

drawbacks The metal springs apparently siphon off the heat produced by the body, giving the patient a feeling of chilliness which may be serious and certainly is not conducive to restfulness Bed rest in itself does not insure rest for an injured or diseased spine. Those who have studied the sleeping human being have reported that the subject frequently changes his position With each change the muscles controlling the spine must change to accommodate to the new position If the patient remains in one position for several hours, he is sure to feel stiff and uncomfortable In either case, rest is not obtained If the spine itself requires rest, a plaster-of-Paris shell made to conform to the natural curves of the body is most effectual Rest for the various muscles is ordinarily obtained by frequent changes of position, in the shells, however, the muscles are not strained and change of position is not essential

To obtain rest for a part of the body or a single joint, properly made casts, splints or braces are used The good which these devices can accomplish is limited by the intelligence and skill behind their application Too often this step is delegated to inexperienced house officers while the designing of braces and corsets is left to brace-makers and corsetières, who, however competent in their own fields, cannot be presumed to understand the surgical conditions for which their apparatus is to be applied The fitting of appliances such as braces and corsets should be closely supervised by the physician, and if he is not competent he should call in a consultant who is

Exercise may be classified as general or local and as active or passive Here is another field in which the average physician is poorly equipped His advice is usually to "take some exercise," but he does not lay down the particulars of the exercise, and experience shows that the patient is not a good judge of the type or amount of exercise, any more than he is competent to prescribe the dosage of morphine or digitalis The judicious combination of exercises of graduated degrees of difficulty within the fatigue limits of the muscles brings the best results

Motion may be relaxed, passive or active Relaxed motion is that type in which the muscles of the part itself are inactive but the action of gravity is used to give motion to the part Passive motion is that type in which a force other than that of the patient's own muscles brings about motion of the part Active motion is that in which the muscles designed to do the particular movement perform the act

Passive motion is usually the first step Active assisted motion, a combination of active and passive, is the second Active motion is the third,

active resisted motion is the fourth, and gives the highest degree of exercise Exercises are frequently begun with the body horizontal or reclining, then in the sitting position, and finally in the vertical or standing position Some mechanical aids are invaluable in bridging the gap between inactivity and normal activity The stationary bicycle for the knees and legs, the rowing machine for the back, the sewing-machine treadle for the feet, marbles for the feet and the collapsible rubber ball for the hands are a few of the simple and more readily available aids The value of exercise for recovery of function lies not in its vigor or the time given to it, but in the regular and systematic performance of each exercise prescribed The physician should change the exercise as often as necessary to meet the development of muscles, and someone should supervise it in order for the best results to be obtained

Local applications of heat before passive or active exercise are valuable in limbering up the part or rendering it less painful Heat is too often used alone, and employed thus can give only temporary help The type of heat and the method of application depend upon the physician's choice While moist heat in the form of hot wet towels applied for a definite period, say twenty minutes, is inexpensive as well as foolproof, dry heat from any of the various infra-red lamps may also have definite usefulness The heat obtained by diathermy has distinct indications In applying moist heat, the patient should be warned against the use of electric heating pads, which may become wet and conduct the electric current through the body, with serious results

Creation of a Favorable Mental Attitude

A condition resembling melancholia is so commonly observed in persons suffering from toxic arthritis that the depth of the depression is often an indication of the patient's general condition, and must be actively treated It is important to point out to him the favorable developments in his condition, and to stress them in comparison with the unfavorable factors It is the encouragement which comes from realization of improvement that gives patients the courage to continue the program upon which ultimate recovery depends Success in developing this mental attitude depends on the physician's ability to apply psychological methods effectively

Relief of Pain

The treatment of toxic arthritis is too often limited to the relief of pain Most of the drugs advocated for the disease are intended primarily for that purpose If this were a self-limiting dis-

cises of gradually increasing difficulty for the various muscle groups should be given, always remembering that exercise of a muscle within its fatigue limit strengthens it, and exercise beyond that limit weakens it

The *skin* is of great importance as an excretory organ in chronic toxic conditions such as arthritis. This function, as well as its heat-regulating one, is invariably disturbed in toxic arthritis. The many small muscles controlling the hair follicles and the sweat glands require development, as well as the larger skeletal muscles. Protection of the skin against sudden and extreme drops in temperature is always necessary in the arthritic, but exposure to the air in a warm atmosphere with transient waves of moderate coolness does much to restore the skin function to normal. Bathing in water of slightly varying temperatures is less practical than bathing in air, and can be recommended only under exceptional conditions. A dry, glazed skin and constant perspiration are but different manifestations of a disturbed skin mechanism.

The *blood*, as in nearly all illnesses, suffers a decrease in the percentage of hemoglobin and in the number of red cells. The functioning of organs giving rise to the white cells is often impaired, but it is difficult to say when this is due to the disease and when to medicaments. When infection is present, the white-cell count is normally increased, as is the percentage of unsegmented polymorphonuclear cells, but because of the disturbed function of the organs giving rise to the white cells, in keeping with the subnormal functioning of the entire body, the cellular response may not follow normal lines. Ordinarily these organs recover without special treatment. Disturbances in the circulation have been studied at some length by Pemberton and his associates. They may be due to the lowering of the heart-muscle tone as well as that in the blood vessels themselves. A lowering of the blood pressure, both systolic and diastolic, would naturally be expected, especially in toxic arthritis of long standing, it returns to normal with increased body activity. It may be well at this point to speak of the importance of the skeletal muscles as accessory organs of circulation. The normal bending of the extremities at the joints, with compression of the veins between the muscles, helps to return blood to the heart. The inactivity of the extremities in arthritis hinders this return of blood, with resultant congestion.

Disturbances of the nervous system are frequently observed. It is not unusual to find the chronic arthritic emotionally unstable or even suffering from "nervous prostration." Psychoses, too, are not uncommon. These are manifestations of the subnormal condition of the nervous system in keeping

with the rest of the body, and they respond to measures used to restore the body as a whole to normal.

The *liver* is a most important organ in the treatment of toxic arthritis. Since it is the principal detoxicating organ, any disturbance of its function is bound to have a profound effect on the body's ability to recover from disease. Clinical tests for the determination of its function are not easily available or universally acceptable. It may be presumed that in arthritis the liver in its detoxicative function needs some assistance at intervals. Small doses of calomel followed by a saline cathartic have been found the most useful and dependable aid.

Protection of Joints

In toxic arthritis, which is a systemic disease with joint manifestations, the ultimate permanent joint damage is greatly influenced by the care of the joints during the activity of the disease. Even chronic toxic arthritis may be self-limiting, but recovery from the disease gives small satisfaction if the joint function is so greatly impaired that normal activity is difficult or impossible. *Rest* and *exercise* are the main methods of controlling the health of the joint structures, and heat is a subsidiary aid.

When rest is advisable, and when exercise, are difficult to state in general terms. Each case presents a problem all its own. In general, rest should be used when, owing to inflammatory reaction, any motion of the joint causes pain and muscle spasm. While it cannot be claimed that in rest there is no danger of inducing stiffness, it can be said without fear of contradiction that continued use of the irritated joint will result in changes which will eventually interfere with its motion. Rest during the active inflammatory period, on the other hand, by preventing further tissue irritation and by permitting the inflammatory reaction to reach its end point at the earliest possible time, allows motion to be started earlier and causes less damage to the joint structures.

There are several methods of obtaining rest, the careless application of which does not necessarily bring about the desired result. Rest in bed is presumably the most complete and effective form. Where the entire body requires rest this form is necessary, but not infrequently its attendant conditions make it impossible. In the first place, the bed must be conducive to rest. The author has observed situations in which a mattress which did not permit a change of position prevented the patient from sleeping for several days. The environment must be congenial and the bed must be neither too hot nor too cold. The inner spring mattress, so much in vogue at the present time and so widely advertised, is not free from serious

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24161

PRESENTATION OF CASE

A forty-two-year-old, white, American factory worker entered the hospital with the complaint of hematuria and right-flank pain.

Six days before entry he began to pass grossly bloody urine. The following day he felt somewhat weak and faint and about noon began to have quite severe pain in his right flank which later extended around to the pubis. The pain was accompanied by a burning sensation on micturition and was only temporarily relieved by hypodermic injections. The hematuria and pain continued up to the time of entry, and he frequently passed clots of blood. He had had no previous genitourinary symptoms.

About twenty years before entry he had had a sore on his penis which was cauterized. For a period of two years following that he had had arm and hip injections. He denied ever having had gonorrhea. He had been married for twelve years, and his wife had never been pregnant. His past history and family history were otherwise negative. He had lost no weight and had always considered himself to be in the best of health.

Physical examination revealed a well-developed and nourished man apparently suffering considerable pain. The heart and lungs were negative. The blood pressure was 120 systolic, 80 diastolic. There were tenderness and spasm in the right upper quadrant and right flank, and the entire abdomen was held fairly tight. No masses were made out.

The temperature was 98.6°F., the pulse 100. The respirations were 22.

The urine was grossly bloody, had a specific gravity of 1.020 and contained a trace of albumin but no casts. The sediment of catheter urine specimens showed occasional granular casts and 300 red cells, 5 white cells and many bacteria per high-power field. The blood showed a red-cell count of 3,060,000 with 60 per cent hemoglobin, and a white-cell count of 9400 with 65 per cent polymorphonuclears. The nonprotein nitrogen of the blood was 49 mg per cent on entry and 29 mg per cent two days later, the fasting blood sugar was 95 mg per cent, and the blood chlorides were equivalent to 103 cc of N/10 sodium chloride. The blood Hün-

ton test was positive, and the blood Wassermann negative. The icteric index was 8, and the van den Bergh was too low to read. A retrograde pyelogram showed abnormal soft-tissue shadows in the right psoas-muscle and right kidney areas. There were no areas of calcification, and the left kidney was not visualized. Injection of the right kidney pelvis and calices revealed intrinsic and extrinsic filling defects. There appeared to be a mass occupying the lower pole of the right kidney which displaced the pelvis upward, so that it was opposite the eleventh rib. The psoas muscle appeared to be obliterated by the mass. A film of the chest showed an unusually high, right diaphragm with a very much limited excursion. There was density in the right lower lobe, and the right costophrenic angle was obliterated. The heart and mediastinum were displaced to the right, and the right lung root was depressed. The aerated portion of the right lung was clear, and the left lung was negative. Three days later an intravenous pyelogram showed somewhat better visualization of the right kidney than previously. The minor calices on the right were slightly dilated, and the pelvis contained multiple irregular filling defects. The outline of the right kidney was clearly seen and appeared to be symmetrically enlarged, with the greatest enlargement in the region of the lower pole and medial aspect of the pelvis. The pelvis and ureter appeared to be displaced laterally. The lower portion of the psoas muscle was visible, but in its upper portion there was an increase in soft-tissue density, which obliterated the outline of the muscle and the kidney. The left kidney pelvis, calices and ureter appeared normal. An x-ray of the chest showed some improvement, with less marked density of the right lower lobe and slightly less elevation of the diaphragm. However, the diaphragm was still very high, and the heart and mediastinum were still displaced to the right of the spine. No fluid was demonstrated in the chest.

On the fourth day the white-cell count was 14,300 with 78 per cent polymorphonuclears, but the temperature remained normal. Two more urine examinations showed from 20 to 50 red cells per high-power field of the sediment.

On the sixth day an operation was performed.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON. I saw this patient three days after the onset of his illness, which occurred in another city, and think it should be stressed a little more that he was in a fair degree of shock. He was really ill with the onset of this hemorrhage. We did an intravenous pyelogram at that time, which showed no function of the right kidney and normal function of the left

ease of short duration, or if the patient tended naturally to recover, the use of pain-relieving drugs would not be objectionable, but under the actual conditions, the use of such medicines is open to serious question. If the measures enumerated under the first four objectives of treatment are effectively carried out, only a minimum of pain-relieving medicine will be required.

Of the many preparations offered for the relief of pain the one of sufficient strength to relieve the pain should be used. But the physician should know the action of the drug on the body as a whole, and should not utilize preparations which, while effective in relieving pain, do serious organic damage to the vital organs. In general, the salicylates and their well-known derivatives should be employed where mild remedies are called for. If it becomes necessary to use excessive quantities, this is evidence that they are not effective, and resort should be had to stronger preparations, even narcotics.

TRAUMATIC ARTHRITIS

Traumatic arthritis may be acute or chronic. The injury resulting from collision with a moving object is likely to be acute, while that resulting from the habitual use of the joint in a faulty manner is likely to be chronic. Acute trauma, unless it causes fracture of the bones entering into the joint, seldom reveals anything by x-ray. Chronic trauma invariably gives rise to hypertrophic changes in and around the joints. Whether the trauma be acute or chronic, rest of the affected joints effectively relieves the symptoms, although

one can hardly expect any modification of the hypertrophic changes of chronic irritation.

In the chronic form, the recognition of the causative agent, whether it be faulty posture, excessive abdominal girth or maldevelopment, is essential to the planning of adequate treatment. Control or correction of the traumatizing factors almost always ensures relief of pain and the halting of the arthritic process.

The surgical treatment of chronic arthritis is essentially the restoration of the joint so as to provide some measure of function after the arthritic process itself is no longer active. Surgical procedures during the active stage of the diseases are frowned upon by those who best understand the pathologic physiology of arthritic diseases.

SUMMARY

A new classification of arthritis based on recognizing bacteria, toxins and trauma as essential etiologic factors, is presented.

The treatment of arthritis is outlined. Bacterial arthritis is essentially a surgical disease, and the treatment is governed by surgical principles. The treatment of toxic arthritis represents the main problem of treatment in arthritis, and effective treatment involves removal of unfavorable factors, restoration of normal physiology, protection of the joints during treatment, creation of a favorable mental attitude, relief of pain. Traumatic arthritis is relieved by removing the traumatic factors.

158 Whitney Avenue

The patient had a small renal tumor — an adenocarcinoma — at the lower pole of the kidney. Curiously enough, there were not a great many vessels around the tumor, and I could see no bleeding point that I could definitely say was the origin of the perirenal hematoma. Although the patient was obese and had a lot of perirenal fat, the kidney freed up pretty well. The fat was quite indurated and I cleaned out the entire fossa and removed the kidney. There was no extension of the tumor into the renal vein or neighboring structures.

PREOPERATIVE DIAGNOSIS

Right kidney tumor with retroperitoneal hemorrhage

DR. ALLEN'S DIAGNOSIS

Tumor of the kidney with rupture of the capsule — probably hypernephroma

ANATOMICAL DIAGNOSES

Renal-cell adenocarcinoma.

Perirenal hematoma

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY. The specimen showed a very sharply circumscribed carcinoma at the lower pole of the kidney, as Dr. Mintz described. We found one small eroded vessel in the capsule, not an impressive lesion to explain such massive hemorrhage, but I suppose it must have come from that spot.

DR. HAMPTON. The diffuse enlargement of the kidney is still unexplained because the kidney was not enlarged.

A PHYSICIAN. Both the hematoma and the tremendous amount of fat which extended anteriorly might account for the shadow.

DR. MALLORY. A great deal of the shadow must have been the hematoma.

DR. HAMPTON. That was our conclusion. Heretofore we have believed that if a patient had a ruptured kidney its outline would be obscured by the hemorrhage. We now have to change our point of view, and when we see a large kidney shadow in a case suspected of ruptured kidney, it may be of considerable significance.

A PHYSICIAN. Why were the heart and mediastinum displaced toward the diseased side?

DR. HAMPTON. He had massive collapse of the right lower lobe due to subphrenic irritation.

CASE 24162

PRESENTATION OF CASE

A thirty-four-year-old, white, American laborer entered the hospital with the complaint of right upper quadrant pain of seven months duration.

Seven months before entry he began to have daily attacks of dull, throbbing pain in the right

upper quadrant, just to the right of the umbilicus, which seemed to radiate down to the right iliac crest. The attacks lasted several hours, occurred more often at night, were unrelated to meals, defecation or activity, and were relieved by walking about but not by taking food or soda. The pain was severe enough to interfere with his sleep, but it did not keep him from working. Shortly after the onset his physician took x-rays of his stomach and gall bladder which were reported to be negative. He was put on a bland diet but this had little or no effect on his symptoms. The pain gradually increased in severity until two months before entry, when it became severe enough to force him to stop working. At about the same time he began to have eructations and flatus in increasing amounts. X-rays taken at that time were said to show "duodenitis," and he was put to bed for three weeks on a first-stage and then second-stage Sippy diet. The treatment had almost no effect on the symptoms, and he began to vomit occasionally, which he thought was due to the large amounts of cream. Five weeks before entry he was put back on a normal bland diet. Nausea and vomiting, however, continued once or twice a week and did give him slight relief from his pain. Three weeks before entry his previously regular bowel habits were interrupted, and he became constipated. His stools were lighter in color and his urine became dark. During the week before entry his pain became extremely severe and was occasionally sharp in character but never crampy. He had no definite jaundice, no hematemesis, no bloody or tarry stools and no cardiorespiratory or genitourinary symptoms. He lost 31 lb. in weight in the six weeks before entry. Sixteen years before entry he had had a nervous breakdown for which he was treated for six months with complete relief of symptoms. The past history was otherwise essentially negative, and the family history was not contributory.

Physical examination revealed a well-developed, slightly undernourished man in no acute distress. There was slight pallor of the skin and mucous membranes. The heart and lungs were negative. The blood pressure was 115 systolic, 75 diastolic. The abdomen was somewhat distended and tympanitic. The entire right side of the abdomen and the region over the sigmoid showed voluntary spasm and was tender to even light palpation. The tenderness was most marked just above and to the right of the umbilicus. The liver and spleen could not be felt, and no masses could be made out.

The temperature was 99°F., the pulse 100. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 3,500,000 with 55 per

All the other findings were about the same as those when he arrived here. I might also add that at that time his abdomen on the right side was rigid.

This retrograde pyelogram shows the displacement of the kidney pelvis upward and laterally as was described, with a large kidney outline—but larger at the lower pole—and with obliteration of the psoas muscle certainly in its upper half. The diaphragm on the right side was, as stated, high and relatively fixed. It is a fairly typical picture of collapse of the right lower lobe, with the fixation of the diaphragm and the general appearance that is usually seen in massive collapse. If he had a tumor of the right lower-lobe bronchus causing collapse of that lobe we should not expect fixation of the diaphragm. Then at examination three days later the lesion in his chest had definitely improved, as had the patient, an intravenous pyelogram done at that time showed function in a previously nonfunctioning kidney, but the filling defects were still present, both inside and outside the kidney pelvis. We thought the inner defects were probably blood clot and the lower defect very likely due to tumor, but we could not explain why the entire right kidney was enlarged and the psoas muscle obliterated, or why the diaphragm was high and fixed.

DIFFERENTIAL DIAGNOSIS

DR ARTHUR W ALLEN: What are the conditions that could cause hematuria? I suppose we must come down to that. We can fairly safely rule out a systemic disease, because blood was coming from only one kidney. In other words, we are probably dealing with a lesion in or around the right kidney.

A good deal of stress is laid on his probable early syphilis, twenty years before he came in. We have a positive Hinton and a negative Wassermann test. He had had two years of treatment which we assume to be antisyphilitic. Could this be a syphilitic lesion of the right kidney? The only thing that I should consider is the possibility of an aneurysm. It was probably not an aneurysm of the aorta, but I wonder if it could be one of the renal artery. I think the man is pretty young to have an aneurysm, even if he had had syphilis twenty years previously. However, we must keep that possibility in mind.

What neighboring structures could be involved that might cause this difficulty in the region of the right kidney? Could it be some outside influence such as disease of the liver or bowel, or could it be some trouble in the psoas muscle itself? We can rule out actual primary disease of the psoas muscle because the man had had an

acute onset only six days prior to entry. So far as I know, deep psoas abscesses or affairs of that sort must be of a chronic nature. This man had lost no weight. Also, I should be inclined to think that the obliteration of the psoas muscle as shown by x-ray was due to the acute episode and was secondary to whatever was the matter with the kidney. If we consider disease of the kidney, we think of the possibility of an aberrant vessel as a cause of hemorrhage and of the possibility of trauma, but we have no history of the latter. If he had had a serious blow in his loin just prior to the onset of his illness we should expect he would show a ruptured kidney with bleeding into the surrounding structures. Could any kind of infection in the kidney produce this picture? It rather seems as though that is not relevant because of the normal white count and temperature. The leukocytosis which developed four days later could be from the absorption of the hematoma which we assume was present about the kidney. Tuberculosis is another cause of kidney damage with blood loss, but this man was too well to have had tuberculosis of the kidney.

We therefore come down to a differential diagnosis of tumor of the kidney, such as hypernephroma or adenocarcinoma that has developed slowly without any effect on this man's general condition and has suddenly burst through its capsule. This sequence of events could explain the acute onset. It could explain the fixed diaphragm, the shadow over the psoas muscle and the hematuria. The only other thing that I can suggest is the possibility of aneurysm based on his old syphilis, and if it were an aneurysm it would have to be aneurysm of the renal vessel. I should expect that if it were aneurysm that there would not be so much obvious tumefaction of the kidney itself and that the kidney would be of normal size. The hematoma about it would, of course, explain the rest of the picture. I believe, however, that this is probably not an aneurysm but a tumor of the kidney, a hypernephroma that has spontaneously ruptured.

CLINICAL DISCUSSION

DR. E. ROSS MINTZ: The question of the type of incision to make was quite a problem. I finally decided to make a retroperitoneal incision, and when I came down to the lumbar dorsal fascia everything seemed to be all right. The moment I incised the fascia and put my hand around the kidney, out came a lot of blood clots. The clots were down in the fossa, and in freeing the kidney at the upper pole, I again ran into a tremendous amount of blood clot beneath the diaphragm. The diaphragm was evidently still pretty high.

adhesions arising from inflammation in neighboring organs, such as the gall bladder, from lesions of the pancreas, usually carcinoma, from enlarged neighboring lymph nodes, and finally there was one case described in which there was obstruction of the third portion of the duodenum from aneurysm of the abdominal aorta directly beneath it

The diagnosis is narrowed down to a tumor of some sort, which may be either extrinsic or intrinsic. Intrinsic tumors are either benign or malignant, and both are quite rare. The incidence of duodenal carcinoma is 0.03 per cent in a total series of 300,000 or 400,000 autopsies.

Of the malignant tumors, primary carcinoma of the duodenum is most frequent. Next in frequency is carcinoma of the papilla of Vater, next perhaps lymphosarcoma, of which there have been 15 cases reported out of a total series of 84 in the large and small bowels, then spindle-cell sarcomas, and most rarely, leiomyosarcoma of which only 2 were reported up to 1935. Extrinsic malignant tumors must be considered. They arise most commonly in the gall bladder or stomach, but frequently in the pancreas or any other neighboring organ. I do not know whether carcinoids should be classed as malignant tumors, Dr. Mallory could tell us more about that. These are the tumors which on staining show an affinity for silver and are found most commonly in the appendix, but have been reported in the small intestine.

The benign tumors are about half as frequent as the malignant ones. The commonest benign duodenal tumors are the adenomas, these are usually polypoid and arise from mucous cells or from Brunner's glands. The next in frequency are the fibromyomas, and finally a varied group including hemangioma, lymphangioma, neuroma, tumors arising from displaced pancreatic tissue, and so forth.

Most of the reports in the literature stress that all malignant and most benign tumors will bleed, so the presence or absence of bleeding does not help us much. I believe we can rule out carcinoma of the papilla of Vater because of the absence of jaundice. Of course any tumor of the duodenum may eventually cause jaundice by encroaching on the common bile duct, and it may be that the imperfect filling of the gall bladder was due to partial obstruction from the tumor mass. So far as I am concerned, the diagnosis of the nature of this tumor is reduced to a guess, and the only possible clue that I can see is the eosinophilia, which is something we often find associated with Hodgkin's disease or lymphosarcoma. As a pure guess I shall say that the tumor was a lymphoblastoma or lymphosarcoma of the duodenum.

PREOPERATIVE DIAGNOSIS

Cancer of duodenum

DR. LUDWIG'S DIAGNOSIS

Primary tumor of the duodenum (lymphoblastoma or lymphosarcoma?)

ANATOMICAL DIAGNOSIS

Carcinoma of duodenum

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY. This patient was operated on by Dr. Arthur W. Allen, who found a large area of ulceration on the posterior wall of the third portion of the duodenum in approximately the region of the papilla of Vater. He felt from the gross examination that it was probably a tumor and that it had invaded the pancreas. He asked me to make a frozen section from a small piece of the ulcer margin, which he resected after opening the duodenum opposite the crater, but I was unable to find any tumor in it. However, he felt strongly enough that the lesion was malignant not to be unduly influenced by that and proceeded to do a cholecystgastrostomy because he felt certain that sooner or later it would obstruct the common bile duct, and also did a gastroenterostomy to relieve the duodenal obstruction. The later sections of the biopsy showed one minute fragment that was certainly carcinomatous and on the basis of that it was decided a couple of weeks later to make an effort at resection. This required removal of practically the whole duodenum and head of the pancreas, and the operation was made considerably harder by the fact that there was an anomalous insertion of the cystic duct. Normally the distance between the papilla and the point where the cystic duct joins the common bile duct is a matter of several centimeters so that ordinarily it would be possible to do such a resection without cutting the cystic duct. In this case, however, the cystic duct entered the common bile duct only 2 cm. from the papilla, right in the area of tumor involvement, so he was forced to anastomose the cystic duct to the common bile duct in the course of his operation, which prolonged it somewhat. The surgery was completed very successfully, but shock developed, and the patient died the following day. The surgical specimen showed an extensive carcinoma and I cannot say from the specimen whether it was primary in the duodenal wall near the papilla or actually in the papilla. My inclination is to believe that it probably started in the papilla but I think it ulcerated from the start and for that reason never obstructed the bile ducts. At autopsy it was found that there were metastases to one of the regional nodes, so that even if the patient had survived the resection he would not have lived a great many months.

cent hemoglobin, and a white-cell count of 13,600 with 75 per cent polymorphonuclears, 14 per cent lymphocytes, 2 per cent monocytes, 7 per cent eosinophils and 2 per cent basophils. The platelets were normal. The guaiac test on the stool was 3+. The blood Hinton test was negative, and a 1:40,000 tuberculin test negative.

A flat abdominal x-ray film showed several areas of calcification in the right side of the abdomen consistent with calcified mesenteric glands. There were no visible ureteral calculi, the kidneys were normal in size and shape, and there were no unusual soft-tissue masses. Two barium enemas showed no evidence of disease within the colon or terminal ileum. An x-ray of the chest was negative. A gastrointestinal series showed no evidence of lesions in the esophagus or stomach, and the duodenal cap was not deformed. At the junction of the second and third portions of the duodenum there was an upward convex curve with a questionable large area of ulceration in that region. No definite surrounding tumor mass was visible. Hourly follow-up films of the small intestine showed no evidence of disease. A re-examination four days later confirmed the presence of a lesion at the junction of the ascending and descending portions of the duodenum. There was a lobulated tumor mass, with probable ulceration, protruding into the lumen in that area. A Graham test showed very faint filling of the gall bladder, much less than in a normal individual.

The patient continued to have abdominal pain and during the first two weeks in the hospital lost 11 lb in weight. On the twenty-second day an exploratory laparotomy was performed.

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES: The lower films simply show a negative colon and negative chest. In the upper group you can see this very definite deformity of the duodenum. The stomach appears normal. When you study these films more in detail the mucosal pattern is seen to be lost over a considerable area. There is an indentation of the duodenum, which is also somewhat dilated. The appearance in the duodenum is that of a large ulcerated mass. Here are the films of the gall-bladder region. There is a faint shadow of the gall bladder. There is no evidence of stones. It is normal in shape, and the only abnormality is the faintness of the shadow. A shadow like this sometimes occurs when the patient has been fasting before examination, I have seen it happen several times. Similar shadows are also seen in cases with tumor of the pancreas. Most of these cases have very faint or absent gall-bladder shadows. There is no reason to expect that the gall bladder is diseased. The lesion from our point of view should

be a tumor of the duodenum, and since I know the answer in this case I will not discuss the possibilities.

DR. ALFRED O. LUDWIG: I wonder if it is fair to ask whether by x-ray the lesion was intraduodenal. It was stated in the x-ray report that there was no visible tumor mass outside.

DR. HOLMES: Such a deformity of the duodenum as this I think would be more likely to occur if the lesion were in the duodenum, but one cannot say it did not extend into it from some external organ.

DIFFERENTIAL DIAGNOSIS

DR. LUDWIG: Before reading over this case my ignorance on the subject of tumors of the duodenum was almost complete, and the only way I could get anywhere was by studying the literature. So far as the story is concerned it is quite typical of tumor in the duodenum or tumor in the small bowel. Dull pain lasting several hours, of paroxysmal nature, is stressed many times in reports of these cases and is quite characteristic. It is quite interesting that mention is made in a number of these cases of early x-rays that have been said to show duodenitis. Nausea and vomiting, constipation and weight loss are also described as characteristic symptoms of tumors occurring in the duodenum or small bowel. Furthermore, the physical findings—the pallor and anemia, the distended abdomen, and the spasm and tenderness—are characteristic in cases that have tumors in this region. It is interesting that most of the cases described also stress the presence of a palpable mass. That may not have been felt here because it was too small or because of the spasm and rigidity that this patient had. The anemia is of a considerable degree,—3,500,000 red cells with 55 per cent hemoglobin,—and I think we can say that some of the anemia was certainly due to blood loss from the bowel. The patient had definite occult blood in the stools, although there was no history of any gross bleeding. I was also interested in the eosinophilia of 7 per cent, and it will eventually lead me to make a guess as to the diagnosis.

So far as the differential diagnosis of obstruction in the duodenum is concerned it has been divided according to its source into intraluminal, mural and extraluminal obstruction. The main causes of the intraluminal type are foreign bodies, particularly trichobezoars or hair balls. These are pretty well excluded by x-ray. Probably this case will fall into the mural group, and obstruction may occur from tumors in this region which are benign or malignant. Congenital stenosis of the duodenum also may cause obstruction, but again I believe that such a diagnosis is ruled out by the x-rays. Finally, there is the extraluminal cause of obstruction from congenital bands, from

be to study the needs of American medicine from the point of view of education, mobilizing the best current opinion regarding the different phases of professional training at its various levels, formulating standards adequate for those levels, and advising universities, hospitals, regulating bodies and governmental agencies on standards, methods and procedures. The end to be attained is better care of the sick. It is the improvement of the preparation of the physician for his peculiar function, from the days of his work as a premedical student until he retires from practice, that is the dominant idea of the new proposal.

There has been developing gradually in this country a widespread opinion that medicine, or speaking more generally the healing art, has been advancing in a too inco-ordinate fashion—a sequel to the remarkable progress in science and the growing general interest in health and ways of promoting it and ways of losing it. It impresses one as a jungle rather than as a well-ordered garden. There is little correlation, great independence of the parts, considerable overlapping and much waste. In fact we ought to have a planned economy, using the word economy in its remote rather than in its immediate sense.

If the plan means the use of intelligence by qualified individuals, the idea meets a favorable reception at once, provided that the authority granted to the body is persuasive rather than coercive. The proposed council would be only advisory in function, and one of the reasons why it has been suggested is fear of increased governmental interference with medical education and medical practice. There can be no doubt that the fear is justified and that there will be continued effort to increase the participation and therefore the control of the government in medicine. This may not be intrinsically wrong, but there are many thoughtful physicians whose opinion is expressed by the well-known saying "It is worse than a crime, it is stupid." Yet the mere mention of a national medical council arouses antagonisms and fears on the part of many persons, because too often "national" means "national gov-

ernmental" and we cannot get away from the idea of force or coercion.

There has developed through the past one hundred and fifty years a sense of the unity of these United States. It was one of the elements in the struggle which, according to our point of view, we call the War of the Rebellion or the Civil War or the War between the States. In the World War it was intensified. It grows with the advance in methods of communication and of transportation. In time and space the widely separated North and South and East and West are closer together now than ever before. There has occurred with this development an extension of the intrusion of the national government into many fields. A critical question is, How far shall it intrude? What is a just and wise delimitation of the field for the national government? No one can say offhand, but there is no human intelligence capable of directing our lives wisely from Washington or from any other place on earth.

It is the fundamental democratic dogma that the adult individual is the best guardian of his own rights and the best director of his own life. No matter what qualifications are necessary because of collectivism or socialism or communism, using these words in their general sense and not in their perverted and more frequent acceptation, individualism will endure. It is the infinite worth of the individual that these last 1900 years have been trying to impress upon us. Lord Acton said of liberty "It is the delicate fruit of a mature civilization." Is there liberty in Socialism or Communism or Nationalism? This is an acid test, devastating if applied to most contemporary organized movements and activities.

A truly national medical council, carried on under the idea that better ways can be found for solving the health problems of the nation and that, in general, people will do what is best for themselves if they know what is best, such a medical council, using science and intelligence and moral suasion rather than coercion, whether direct or indirect, might make a great and significant contribution to our national life. We need to learn

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FOR VALOR

THE six members of the Governor's Council, the majority of members of the Massachusetts Medical Society, the members of many other organizations, and the numerous individuals, all interested in the health of the people, deserve well of the Commonwealth of Massachusetts. By their actions or efforts, an attempt to lower the standard of public-health administration in this Commonwealth has been overthrown, and because of this, we herewith offer this citation.

The fact that we have been given this exceptional privilege should make everybody, but especially every doctor, stop and think. Experienced practical politicians will generally admit, when speaking off the record, that when it is organized, the potential vote-getting power of the medical profession is the greatest that exists in any po-

litical unit. Its unpredictability, however, is as great as its potential strength. It can be counted on to enforce any measure that is for the ultimate good of its patients, and therefore of the poor and underprivileged. But, because of its uncompromising intellectual honesty, it has the habit of making up its own mind about what the actual rather than the political worth of the proposition in question may be. This is very confusing to the *died* in-the-wool politician who regards such a matter as the public health of the State as of little relative importance compared to party regularity or the "affection of the people" of any community.

Let us not forget this illuminating experience and let us not fail to remind those courageous men who, by their vote, put public welfare above private political expediency that we, as individuals, are grateful so grateful, that when they again have to speak up for the poor, the sick, the crippled and the dying,—as we have been warned they will,—they can count on our wholehearted backing.

A NATIONAL MEDICAL COUNCIL

News from the recent meeting in Chicago of the Council on Medical Education and Hospitals of the American Medical Association suggests a somewhat new approach toward the solution of the problems confronting the medical profession. It is perhaps primarily a shift in emphasis, and the dominant note struck is "education." References to the address of Dr. Willard C. Rappleye have been made in the lay press, but what has attracted most attention is the suggestion that there be formed a National Medical Council, to be composed of representatives of universities, medical schools, hospitals, the practicing profession, specialist examining boards, state licensing boards and public-health agencies. It is interesting to note that this proposal was made during a discussion at the Congress on Medical Education and Licensure, with representatives of the hospitals participating.

The functions of the proposed council would

little success—in the ice-cold streams of New England during early spring

His death was a great shock to his friends, who were legion. He certainly made the most out of life, and to many of us there must creep in the hope that we may, within our spans, be able to accomplish as much as he did

R N N

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No. 68 CENTRAL PLACENTA PREVIA

Mrs. E. K., a thirty-five-year-old multipara in her thirty-sixth week of pregnancy, was referred by her local physician to the prenatal clinic on February 14 because of bleeding.

There was no record of the family history. Her past history was noncontributory except for influenza in 1918. She had had five normal deliveries and one forceps delivery of a stillborn baby, which was said to have been very large. Catamenia began at fourteen, had a twenty-eight-day cycle and lasted five days without pain. Her last period was June 15, making the estimated date of delivery March 21.

Upon physical examination the lungs showed no rales and were resonant throughout. The heart showed no enlargement, there were no murmurs. The blood pressure was 120 systolic, 70 diastolic. The fundus was 27 cm. above the symphysis, and the baby was in LOA position. The urine showed no albumin or sugar.

The present pregnancy had been normal until January 25, when the patient, while trying to vomit, had passed about a pint of blood by vagina. She passed a large clot following this but had no further flow. On February 6 the patient awoke during the night to find that she had had a small amount of bleeding. Since that time she had been in bed and under her physician's care. During the night of February 11 she awoke to find herself in a pool of blood, and bleeding of an undetermined amount continued for about four hours. At that time the patient passed a large clot, and the bleeding stopped. She stayed in bed from that time until her admission to the hospital and had no further complaints except marked thirst. All these spells of bleeding were painless, and there was no evidence of uterine

cramps or spasm. There was no abdominal tenderness at any time.

On arrival at the hospital the patient was sent at once to the labor room and a delivery room was set up with a bagging set. Her blood was typed for transfusion. The patient was prepared in the usual manner and examined by the attending physician and the resident. The cervix was patulous and admitted two fingers without difficulty. The placenta could be plainly felt, and on gentle exploration appeared to extend about the whole circumference of the cervix.

As the resident withdrew his fingers, they were followed by a stream of bright blood. A No. 6 bag had already been tested, folded and clamped by uterine forceps. The bag was at once inserted into the cervix and filled with fluid, thereby controlling the hemorrhage.

The patient started shortly in regular labor, and in about two hours the cervix was fully dilated. During labor the blood pressure varied between 100 and 115 systolic, and the pulse rate averaged 92. As soon as the bag was through the cervix, it was removed from the vagina and the baby delivered by internal podalic version. The placenta and membranes came away at once. The baby breathed spontaneously and weighed 6 lb.

On examination the placenta showed a central area covered with dark blood clot.

After delivery the uterus behaved well, and there was no unusual bleeding. The patient was given posterior pituitary extract and ergot, one ampule of each. Ergot by mouth, to maintain firm contraction, was commenced as soon as the patient could retain it. Recovery was uneventful, and mother and baby were discharged well.

Comment. Although painless vaginal bleeding in considerable amount during the last third of pregnancy is always suggestive of placenta previa, positive diagnosis can be made only by inserting the finger through the cervix and feeling the placenta. As in every case where immediate delivery may be necessary, all surgical precautions in the preparation of patient and doctor must be taken.

This case well illustrates what additional preparations are necessary to insure the minimum risk for the mother and baby. If the family physician had tried to diagnose the condition at home, the patient might have died from hemorrhage before reaching the hospital. The patient should have been hospitalized on January 25, when bleeding first occurred. The favorable outcome in this case is no argument for procrastination. It is not safe to allow a patient to bleed two or three times without an attempt's being made to determine the source of the bleeding.

Simply to put a patient to bed who bleeds in the

to distinguish between our nation and our government, and to realize how much there is which we do as a nation in which the federal government has properly no part

A penetrating critic of modern life has said "The dangers arising are great, particularly in our democratic societies. The directive force of reason is weakened. The leading intellects lack balance. They see this set of circumstances, or that set, but not both sets together. The task of co-ordination is left to those who lack either force or the character to succeed in some definite career." The pertinence of this to governmental direction is perhaps apparent. The problem is, first, to secure, for such co-ordination as is desirable, persons who for sheer ability have succeeded in some definite career, and secondly, to refuse to grant them coercive power, so that they may persuade rather than compel.

OBITUARY

BENJAMIN WHITE

1879-1938

BENJAMIN WHITE was born in Cooperstown, New York, on January 15, 1879. He received a Ph B degree from Yale University in 1900 and was appointed Robinson Fellow in the same year. While holding this fellowship he studied in Berlin, Munich, Vienna and London, and in 1903 was given a Ph D degree by Yale. During the same year he was made assistant director of the Department of Bacteriology, Hoagland Laboratory, Brooklyn, New York, and in 1907 was appointed director. Because of ill-health he was obliged to go to Saranac, New York, in 1909, and after recovering from his acute illness, worked as an assistant in the Saranac Lake Laboratory until 1911, when he returned to his former position. He also served as consulting bacteriologist to the Long Island College Hospital from 1911 until 1914, when he was appointed assistant director of the Bacteriological Laboratories, New York City Department of Health, and was placed in charge of the biological laboratories at Otisville, New York. In 1920 he was made director of the Division of Biological Laboratories, Massachusetts Department of Public Health, with his chief duty the supervision of the Antitoxin and Vaccine Laboratory at Forest Hills. This position he held until 1933, when he was forced to resign because of ill-health.

For the past few years he had lived in New York City, spending most of his time collecting data for and writing a book, *The Biology of Pneumococcus*, which was published this year by the Commonwealth Fund. At the time of his death he was retained by the Commonwealth Fund in a consulting capacity.

When he came to Boston in 1920 he was made a member of the Department of Preventive Medicine and Hygiene, Harvard Medical School, and at the time of his retirement was assistant professor in this department and also in the Department of Bacteriology. In 1920 he was appointed lecturer on biologic assaying and immunology at the Massachusetts College of Pharmacy, and became an associate professor in 1922, which position he held until 1925. Since 1926 he had been a member of the editorial board of the *New England Journal of Medicine*, and during the War had served as a captain in the Sanitary Corps.

He was a fellow of the American Academy of Arts and Sciences, an honorary fellow of the Massachusetts Medical Society and an honorary member of the Aesculapian Club. His memberships included the National Tuberculosis Association, the American Association of Pathologists and Bacteriologists, the Society of American Bacteriologists, the American Public Health Association, the Society of Experimental Biology and Medicine and the American Association of Immunologists.

In 1935 he married Nona Solari, of New York City, and those who knew him intimately realize that the last three years of his life were his happiest. Severely handicapped by a badly damaged heart, he was able to carry on, even spending several months abroad during the past summer, and as a climax, he completed his book and so handed down to posterity a knowledge of intricate facts possessed by few and never before made available to others.

He was an indefatigable worker, and his insistence for detail and accuracy was largely responsible for the many improvements in the manufacture, distribution and use of biological products that had their origin in the Antitoxin and Vaccine Laboratory while he was director. The laboratory itself was a model institution, and the people of Massachusetts received the benefits derived from the distribution and use of biological products of the highest grade.

A great lover of the out-of-doors but necessarily limited in activity on account of health, his favorite avocation was trout fishing. Educated on the Beaverkill and the Esopus, he was an expert with the dry fly, and refused to degrade himself with the lowly worm even when fishing—usually with

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Kansas City University of Physicians and Surgeons,
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- McKEOUGH, WILFRED A., Hampshire County Sanatorium
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town.
Tufts College Medical School, 1936

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- PIJOAN, MICHEL, 24 Chestnut Hill Terrace, Chestnut Hill
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Tufts College Medical School, 1933
- RABINOWITZ, JAMES I., 1284 Commonwealth Avenue, All-
ston
Tufts College Medical School 1932.
- RAVREBY LOUIS, 330 Mt. Auburn Street, Cambridge.
Boston University School of Medicine, 1936.
- RICHTER, HARRY J., 1056 Commonwealth Avenue, Boston.
University of Michigan Medical School, 1932.
- RICKLESS, HERMAN 111 Fellsway West, Medford.
Tufts College Medical School, 1930
- SALUNDERS, GORDON A. 47 Horne Road, Belmont.
Harvard Medical School, 1935

last months of her pregnancy is unintelligent procrastination. An examination is imperative, and a hospital is the only place where such examination can be intelligently made. It was really good fortune that serious hemorrhage did not occur before this patient reached the hospital. The method of treatment after the patient reached the hospital was ideal.

The baby's risk depends on how extensively the fetal circulation has been damaged by the placental separation, which, in turn, is conditioned, to a large extent, by the site of placental implantation, the method of delivery is of secondary importance.

LEGISLATIVE NOTES

On April 1 the Committee on State and National Legislation issued a new Legislative Bulletin which will be sent to any fellow on request.

Since April 1 the following changes in status have taken place in the bills in which we are interested.

House Bill 39, relative to the definition of the terms 'rendering medical service,' 'practice of medicine' and 'holding one's self out as a practitioner of medicine' and its companion bill House Bill 40, exempting certain classes, such as dentists, optometrists and so forth, from the above bill, have been voted 'no legislation necessary' by the Legislature.

House Bill 1529, which provided for the furnishing by the Commonwealth of free oxygen tents to the hospitals in cities of over 30,000 population, has been given 'leave to withdraw' by the Legislature, as has House Bill 1650 which was an act changing the charter of Middlesex University.

House Bill 758, which was a bill to postpone the operation of the statute raising the standards of medical education from January 1, 1939, to January 1, 1942, has been redrafted and is now to be known as House Bill 1845. The new bill postpones the action for two years instead of three years and has been passed in the House.

House Bill 456, which provided for a state fund to replace the present workman's compensation law, has been given 'leave to withdraw' by the Legislature.

House Bill 1084, which provided that the restrictions in regard to graduates of a poorer grade of medical schools should be lowered, has been given 'leave to withdraw,' and this action has been approved by the Senate.

Of House Bill 1279 and Senate Bill 361, both of which provided for the issuance of certificates of approval for bacteriological laboratories, the former has been referred to the next annual session and the latter given 'leave to withdraw' by the House. Final action by the Senate, however, has not been taken.

The bill for the annual registration of physicians, House Bill 41, has been voted 'no legislation necessary' by the House. It will now go to the Senate.

House Bill 42, relative to the suspension or revocation of certificates to practice medicine, has been passed to be engrossed. We favored this bill.

Of the fifty six bills in which the Committee on State and National Legislation is interested, which were before the current Legislature, thirty-one have been disposed of for this session.

APPLICANTS FOR FELLOWSHIP

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Middlesex College of Medicine and Surgery, 1931

Submitted by John I B Vail, *Secretary*

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MACEK, JAMES J., 4 Centre Street, Adams
Tufts College Medical School, 1936

ROBERTS, PERCIE, Sheffield.

Middlesex College of Medicine and Surgery, 1929

SHIBEL, EDWARD E., 205 East Main Street, North Adams.
Georgetown University School of Medicine, 1934

Submitted by Hugh J Downey, *Secretary*

BRISTOL SOUTH DISTRICT

BARRETT, JAMES A., 227 Union Street, New Bedford.
Maryland Medical College, 1910

LECLAIR, HORMIDAS H., 227 Union Street, New Bedford.
Tufts College Medical School, 1914

Submitted by Charles Shanks, *Secretary*

ESSEX NORTH DISTRICT

EWELL, JOHN W., The Close, Rowley
Harvard Medical School, 1936

ODDY, PARKINSON L., 477 Essex Street, Lawrence.
Middlesex College of Medicine and Surgery, 1932

QUIGLEY, THOMAS J., 102 Main Street, Andover
Boston University School of Medicine, 1928

ST LOUIS, LIONEL E., 359 Haverhill Street, Lawrence.
Middlesex College of Medicine and Surgery, 1931

SZOSTAK, RAYMOND G., 250 Prospect Street, Lawrence.
Kansas City University of Physicians and Surgeons,
1931

Submitted by Elmer S Bagnall, *Secretary*

ESSEX SOUTH DISTRICT

ALEXANDER, HAROLD G., Beverly Hospital, Beverly
Tufts College Medical School, 1937

GREEN, HARRY, 31 Middle Street, Gloucester
Massachusetts College of Osteopathy, 1929
Middlesex College of Medicine and Surgery, 1932.

HOPKINS, STANFORD W., 7 South Street, Marblehead.
Harvard Medical School, 1933

MERRILL, EVERETT A., 3 Lewis Street, Lynn.
Tufts College Medical School, 1913

PATTERSON, GEORGE W., 44 Lewis Street, Lynn.
College of Medical Evangelists, 1935

Submitted by Ralph E. Stone, *Secretary*

FRANKLIN DISTRICT

FOOTNICK, SAMUEL, 11 Prospect Street, Orange.
Middlesex College of Medicine and Surgery, 1930

Submitted by Charles Moline, *Secretary*

- MILLER, ROBERT T. JR., Duxbury
Johns Hopkins University School of Medicine, 1903
- PARISH, FRED A., 191 South Avenue, Whitman.
Middlesex College of Medicine and Surgery, 1931
- Submitted by Fred F. Weiner, *Secretary*

SUFFOLK DISTRICT

- BRADLEY, JOSEPH J., Boston City Hospital, Boston.
Boston University School of Medicine, 1935
- DECKER, BRIANT L., 462 Park Drive, Boston.
Harvard Medical School, 1930
- DEUTSCH, EMMANUEL, Boston City Hospital, Boston.
Tufts College Medical School, 1935
- FRANKMAN, WILLIAM, 362 Commonwealth Avenue, Boston.
St. Louis College of Physicians and Surgeons, 1921
- GOODBERG, BURTON C., 818 Harrison Avenue, Boston
Boston University School of Medicine, 1935
- HEELS, GEORGE E., Long Island Hospital, Boston Harbor
Harvard Medical School, 1932
- HOSAMEL, EDWARD H., 186 Dorchester Street, South Boston.
Middlesex College of Medicine and Surgery, 1931
- KAMENS, ISRAEL M., 109 Washington Avenue, Chelsea.
Boston University School of Medicine, 1935
- LARSEN, CARL C., 657 East 5th Street, South Boston.
Tufts College Medical School, 1933
- MALOOF, FREDERIC G. F., 204 Huntington Avenue, Boston.
Middlesex College of Medicine and Surgery, 1931
- MARTIN, SAMUEL F., 243 Charles Street, Boston.
Harvard Medical School, 1934
- PIERCE, FRANK R., Long Island Hospital, Boston.
Harvard Medical School, 1934
- POLLOCK, HENRY M., JR., Boston City Hospital, Boston.
Boston University School of Medicine, 1936
- ROIFF, HARRY S., 159 Shurdeff Street, Chelsea.
St. Louis College of Physicians and Surgeons, 1923
- SULKOWITZ, HIRSH W., 109 Mt. Vernon Street, Boston.
Johns Hopkins University School of Medicine, 1932
- VILKER, ARTHUR H., 1510 North Shore Road, Revere.
Middlesex College of Medicine and Surgery, 1930
- Submitted by John P. Monks, *Secretary*

WORCESTER DISTRICT

- CAMERON, DONALD E., Worcester State Hospital, Worcester
Glasgow University, 1924
- EDWARDS, HUGH S., Worcester County Sanatorium, Worcester
Medical College of Virginia, 1935
- KANE, GEORGE D., 3 Germain Street, Worcester
McGill University Faculty of Medicine, 1936
- LORGE, HEINZ, Rutland State Sanatorium, Rutland.
University of Frankfurt, 1933
- MAHONEY, JOSEPH A., 700 Pleasant Street, Worcester
Kansas City University of Physicians and Surgeons, 1926
- MCCABE, GEORGE E., The Memorial Hospital, Worcester
Tufts College Medical School, 1936
- MEYERS, JACK, 771 Main Street, Worcester
Boston University School of Medicine, 1936
- O'BOYLE, THOMAS J., 228 Main Street, North Brookfield.
Middlesex College of Medicine and Surgery, 1928

- RUSSELL, FRANK H., 78 Burncoat Street, Worcester
University of Tennessee College of Medicine, 1917
- SULLIVAN, EDWARD C., 6 Stoneland Street, Worcester
Middlesex College of Medicine and Surgery, 1929
- TANNENBAUM, ISRAEL S., 985 Main Street, Worcester
Kansas City University of Physicians and Surgeons, 1929
- VESTAL, TOM F., Worcester County Sanatorium, Worcester
University of Maryland School of Medicine and the
College of Physicians and Surgeons, 1929
- WOLBARSH, ABRAHAM, Worcester Hahnemann Hospital,
Worcester
Tufts College Medical School, 1937
- Submitted by Erwin C. Miller, *Secretary*

WORCESTER NORTH DISTRICT

- WHEELER, CHARLES A., 106 West Street, Leominster
Harvard Medical School, 1935
- Submitted by Francis M. McMurray, *Secretary*

MEDICAL POSTGRADUATE
EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning April 25

BARNSTABLE

Sunday, May 1, at 4:00 p. m., at the Cape Cod Hospital, Hyannis. Subject The Use and Misuse of Prontylin. Instructor R. Cannon Eley. John I. B. Vail, *Chairman*

BERKSHIRE

Thursday, April 28, at 4:30 p. m., at the House of Mercy Hospital, Pittsfield. Subject The Use and Misuse of Prontylin. Instructor Benjamin W. Carey, Jr. Melvin H. Walker, Jr., *Chairman*

BRISTOL SOUTH (Fall River Section)

Monday, April 25, at 4:30 p. m., at the Union Hospital, Fall River. Subject Toxemias of Pregnancy. Instructor Joseph W. O'Connor. Howard P. Sawyer and Robert H. Goodwin, *Chairmen*

ESSEX NORTH

Friday, April 29, at 4:30 p. m., at the Lawrence General Hospital, Lawrence. Subject Toxemias of Pregnancy. Instructor James C. Janney. John Parr, *Chairman*

FRANKLIN

Wednesday, April 27, at 8:00 p. m., at the Franklin County Hospital, Greenfield. Subject Early Syphilis. Instructor Francis M. Thurmon. Halbert G. Stetson, *Chairman*

HAMPSHIRE

Thursday, April 28, at 4:00 p. m., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8:00 p. m., in the Outpatient Department of the Skinner Clinic, Holyoke Hospital, Holyoke. Subject The Use and Misuse of Prontylin. Instructor R. Cannon Eley. George D. Henderson and George L. Schadt, *Chairmen*

STILLMAN, JAMES S., 164 Elgin Street, Newton Centre.
Harvard Medical School, 1934

TAURO, ARTHUR L., 53 Fellsway West, Medford
Boston University School of Medicine, 1936

WALSH, JAMES R., 189 Concord Street, Framingham
University of Pittsburgh School of Medicine, 1928

WHITE, SEYMOUR J., 17 Washington Street, Malden
University of Paris Medical School, 1936

Submitted by Alexander A. Levi, *Secretary*

NORFOLK DISTRICT

AISNER, MARK, 36 Fessenden Street, Mattapan
Tufts College Medical School, 1935

BALABAN, JOSEPH S., 392 Broadway, South Boston (Residence Brookline.)
University of Constantinople, 1919

BETTS, REEVE H., 1101 Beacon Street, Brookline
Harvard Medical School, 1933

BIGELOW, ROBERT B., 302 Adams Street, Milton
University of Michigan Medical School, 1932

BIGURIA, FERNANDO, 214 Riverway, Roxbury
National University, Guatemala City, C A, 1929

CARNICELLI, THOMAS J., Exchange Street, Millis
Tufts College Medical School, 1934

CHRISTIAN, HENRY A., 1731 Beacon Street, Brookline.
Johns Hopkins University School of Medicine, 1900

CIVEN, EVA, 1077A Blue Hill Avenue, Dorchester
Middlesex College of Medicine and Surgery, 1926

CONE, GERTRUDE, 200 Minot Street, Dorchester
Tufts College Medical School, 1937

CONNOR, JOHN H. F., State School, Wrentham.
College of Physicians and Surgeons, Boston, 1907

DIRAGO, JOSEPH V., 44 York Terrace, Brookline.
Middlesex College of Medicine and Surgery, 1932

DOLAN, RALPH F., 529 Gallivan Boulevard, Dorchester
Tufts College Medical School, 1931

DONLEY, DOROTHY E., Boston State Hospital, 591 Morton Street, Dorchester Center
Vanderbilt University School of Medicine, 1930

EDDY, AUGUSTINE W., 82 Walpole Street, Norwood.
Tufts College Medical School, 1932

EGAN, WILLIAM J., 20 Richfield Street, Dorchester
Harvard Medical School, 1936

FINKELSTEIN, SAMUEL M., 72 Edson Street, Dorchester
Middlesex College of Medicine and Surgery, 1931

FLAKE, CARLYLE G., 300 Longwood Avenue, Roxbury
University of Virginia Department of Medicine, 1931

FRIEDGOOD, HARRY B., 25 Shattuck Street, Roxbury
Johns Hopkins University School of Medicine, 1928

GETTING, VLADO A., 11 Perkins Square, Jamaica Plain
Harvard Medical School, 1935

GLASSMAN, NATHAN B., 1039 Blue Hill Avenue, Dorchester
College of Physicians and Surgeons, Boston, 1916

GLODT, MILTON, 19 Thatcher Street, Brookline.
University of Basel, Switzerland, 1936

HELVIG, ELSON B., 179 Kent Street, Brookline.
Indiana University School of Medicine, 1932

HENDRIX, OLIN C., 249 River Street, Mattapan.
Harvard Medical School, 1929

JOHNSON, PAUL REVERE, 11 Evans Road, Brookline.
Tufts College Medical School, 1932.

KIMMEL, CHARLES B., 368 Longwood Avenue, Roxbury
Northwestern University Medical School, 1933.

LIA, BIANCA R., New England Hospital for Women and Children, Roxbury
University of Pittsburgh School of Medicine, 1932.

LYONS, CHAMP, 26 Pilgrim Road, Wellesley
Harvard Medical School, 1931

MAHER, JOSEPH P., 238 Walnut Street, Dedham.
Tufts College Medical School, 1935

MURPHY, LAURENCE J., 53 Stockton Street, Dorchester
Tufts College Medical School, 1936.

NICKERSON, DONALD A., Centre Street, Dover
Tufts College Medical School, 1933

PARSONS, EVELYN L., 326 Washington Street, Wellesley Hills
Boston University School of Medicine, 1932.

REESE, CHARLES A., 249 River Street, Mattapan.
Harvard Medical School, 1906.

RINKEL, MAX, 439 Washington Street, Brookline.
Christian Albrechts University Medical School, Kiel, 1926

ROSEN, HENRY, 128 Sewall Avenue, Brookline.
Tufts College Medical School, 1936.

RUBY, SYLVIA, 60 Beals Street, Brookline.
Woman's Medical College of Philadelphia, 1935

SHENKER, HAROLD L., Main Street, West Medway
Kansas City University of Physicians and Surgeons, 1932.

SOLOMON, PHILIP, 58 Wolcott Road, Brookline.
Harvard Medical School, 1930

STEWART, HAROLD L., 195 Winthrop Road, Brookline.
Jefferson Medical College of Philadelphia, 1926.

SULLIVAN, CHARLES L., Boston Lying in Hospital, Roxbury
Boston University School of Medicine, 1935

WENZLER, FRANCIS J., 385 Columbia Road, Dorchester
Tufts College Medical School, 1934

WEST, FRANCIS J., 22 Alteresko Avenue, Dorchester
Harvard Medical School, 1935

Submitted by Frank S. Cruickshank, *Secretary*

NORFOLK SOUTH DISTRICT

DAVIS, GEORGE W., Quincy City Hospital, Quincy
University of Rochester School of Medicine, 1934

DURANTE, FRANK, 686 Broad Street, East Weymouth.
Middlesex College of Medicine and Surgery, 1931.

McGOWAN, JOHN M., 1245 Hancock Street, Quincy
Dalhousie University Faculty of Medicine, 1933

SHANNON, PAUL J., 106 Central Street, Hingham.
Middlesex College of Medicine and Surgery, 1930

SHEFFNER, SIDNEY A., 8 Dartmouth Street, Quincy
Tufts College Medical School, 1930

SOLOMON, SAMUEL, 452 Washington Street, Quincy
Middlesex College of Medicine and Surgery, 1932.

Submitted by Robert L. Cook, *Secretary*

PLYMOUTH DISTRICT

FORTUNOW, JACOB J., Main Street, Marshfield.
Middlesex College of Medicine and Surgery, 1930

GOLDEN, JOSEPH F., 85 Park Street, Stoughton
Tufts College Medical School, 1911

KELLY, ALBERT L., 37 Brockton Avenue, Abington
Middlesex College of Medicine and Surgery, 1932.

before consulting a physician, but it is far better than the figure of more than six months. The physicians of Massachusetts are taking the lead in referring patients to the cancer clinics. In the early days of the movement, many patients came to the clinics because of newspaper publicity. The percentage referred by physicians was relatively small. Today, this has entirely changed. Nearly 90 per cent of all cancer patients who are attending the Massachusetts cancer clinics are referred by their physicians. The teaching clinics have had a great deal to do with this change in the referring of patients by physicians. Will you explain the development of these clinics?

Dr Chadwick Teaching clinics were instituted in 1933. They are conducted in the same locality and at the same time as one of the regular clinics. The local medical profession invites to these special clinics some individual physician, whose specialty is cancer, he meets with the local group and discusses from his experience improved means of diagnostic procedure and treatment. The number of such clinics has increased from 2 in 1933 to 69 in 1937. In the first year, only 75 physicians attended these clinics. In 1937, 1384 physicians were in attendance. This enormous increase is another index of the success of the Cancer Program. Has there been an increase in the number of individuals with cancer coming to the clinics?

Dr Lombard The total individuals with cancer attending the clinics has steadily increased. In the first year there were 302. In 1937 there were 1319. The total attendance at the cancer clinics in 1937, including new and old cancer patients, as well as non-cancer patients, was 12,454. Of the new patients, about one third had cancer. Of the old patients, a much larger percentage had cancer. Of the group of 302 cancer patients who came in 1927, 24 per cent are alive today.

Each part of the cancer program that has been discussed so far has depended for its success on the mutual efforts of the medical profession, the public health profession, and the laity. Of all the underlying parts of the program, which do you consider the most completely dependent on the individual co-operation of every person in the Commonwealth and the most far-reaching in end result?

Dr Chadwick Without any hesitation, I feel that our state-wide educational plan, which we call advisedly the Co-operative Cancer Control Committee Program, is the cornerstone of the Massachusetts Cancer Program. This program for the dissemination of information concerning cancer consists in the teaching of exact knowledge by an authority in the person of the family physician to the individual as one of a small group. To accomplish this in a state of 355 communities with a population of nearly 4,500,000 and nearly 7000 physicians, each community in the State has, or is in the process of having, a Co-operative Cancer Control Committee. The individual committees are integral parts of the state-wide Co-operative Cancer Control Program. Two hundred and seventy-five of the communities in the state are organized at the present time. These committees differ from many other educational committees in that they are not selective and consequently restricted to limited groups or classes but are rather inclusive in nature and represent every type of group and individual in the community. Over 6000 representatives have agreed to serve on these committees and to urge their respective clubs or groups to have annual talks on cancer given by local physicians. The records show that over 100,000 individuals in this State were reached with cancer talks during 1937.

Dr Lombard This educational program, which began in Massachusetts and is being watched with interest all over the world, seems to be direct and simple in plan. Why do you think it has been so much more successful than other educational plans for the control of this disease?

Dr Chadwick The essence of the success of the educational methods of the Massachusetts Cancer Program lies in its inherent sharing of known facts about cancer by a generous and informed profession with a co-operative and receptive public. Fears are not stressed; they are rationalized. Symptoms are not presented as the basis of exact knowledge; they are merely alluded to in the sane discussion of the larger problem. The physician, with his increasing interest in the progressive steps in the knowledge of cancer, the disease, presents the subject simply and intelligibly. The public, responding as an individual would respond to a real discussion of an absorbingly interesting subject, rises to the mental challenge of this approach. As a result, all classes, groups, races and professions are united in this basic co-operative and successful program which disseminates exact knowledge concerning cancer. This engenders a realization of the need for prompt action. Exact knowledge and prompt action effect control.

RECENT DEATHS

BULLIAN—MOSES BULLIAN, M.D., of 274 Seaver Street, Roxbury, died November 17, 1937. He was in his fifty-third year.

A native of Russia, he received his degree from Kiev Medical Institute in 1912. He was a fellow of the American Medical Association and the Massachusetts Medical Society.

His widow survives him.

COTTON—FREDERIC JAY COTTON, M.D., of 239 Beacon Street, Boston, died April 14. He was in his sixty-ninth year.

Born in Prescott, Wisconsin, he was graduated from Harvard University in 1890 and received his degree from Harvard Medical School in 1894. Following his graduation he was for several years house surgeon at the Massachusetts General Hospital, after which he studied at the University of Vienna. He also attended the College of Physicians and Surgeons in New York City. For several years Dr. Cotton was assistant surgeon at the Children's Hospital, following which he became head of the bone and joint department of the Boston City Hospital, a post which he held from 1902 to 1931. He was chief-of-service at the Boston City Hospital from 1920 to 1931, and in 1927 organized the Bone and Joint Service. Upon resigning in 1931 he was elected president of the hospital staff. At this time he was also assistant professor of surgery at Tufts College Medical School and a lecturer on bone and joint surgery at Harvard Medical School and Harvard Medical School, Courses for Graduates.

Dr. Cotton was a founder and member of the board of governors of the American College of Surgeons. His affiliations included fellowships in the American Surgical Association, the American College of Surgeons, the Massachusetts Medical Society and the American Medical Association, and memberships in the Boston Surgical Society, the Boston Orthopedic Club and the New England Surgical Society. He was an honorary member of the American Academy of Orthopedic Surgeons.

His widow and a daughter survive him.

HAMPSHIRE

Wednesday, April 27, at 4 15 p m, in the Nurses Home, Cooley Dickinson Hospital, Northampton. Subject Some Complications of Labor Analgesics in Labor Instructor James C Janney Warren P Cordes, *Chairman*

MIDDLESEX SOUTH

Wednesday, April 27, at 4 00 p m, at the Cambridge Municipal Hospital, Cambridge Street, Cambridge. Subject Drug Therapy in Pediatrics Instructor Warren R. Sisson Edmund H Robbins, *Chairman*

THE MASSACHUSETTS CANCER PROGRAM

Dr Chadwick A year has passed since I have had an opportunity to discuss the Massachusetts Cancer Program with you. At that time a report of the accomplishments of the first ten years was presented. Tonight the achievements of another year will be demonstrated. And yet, these remarkable incidents can scarcely be called the results of any single year. A program that is so thoroughly integrated among all the individuals in the State gains momentum as it progresses, and each year represents the cumulation of all preceding years rather than the limited results of the single year in question. This month is Cancer Month' throughout the United States. Massachusetts is co-operating by making public the regular activities of the State Cancer Program, for this State has twelve cancer months. For example, during this month of April there will be, in 21 strategic points throughout the State, 76 state aided cancer clinics at which there will be an average attendance of 20 physicians and an average attendance of 18 patients. At each of these 21 cities, in place of one of the regular clinics, will be a cured-cancer clinic at which cured cancer patients have volunteered to present themselves to show what has been done for them and what may be done for others. On April 1, for example, 18 cured cases were presented at the Springfield clinic, 10 were presented at the Greenfield clinic, and yesterday 30 were presented at Fitchburg and 5 at Newburyport. More than 300 cured cases will be presented altogether throughout the State. The other clinic communities in which cured cases will be shown are Boston,—at the Beth Israel Hospital and the Boston Dispensary,—Brockton, Fall River, Gardner, Gloucester, Hyannis, Lawrence, Lowell, Lynn, New Bedford, North Adams, Northampton, Pittsfield, Worcester, Pondville and Westfield. There is hardly a residence in the State more than twenty five miles distance from one of these centers. This new presentation of these 21 cured-cancer clinics in these points near every home will bring the fact of the curability of cancer close to every person. Many of us recognize that most cancer is curable if treated early, but to see individuals who have had the disease and now are free from it and have had no sign of a recurrence for at least five years, is a comforting and reassuring sight.

Dr Lombard Before you mention the other parts of the regular program that are being publicized this month, will you explain what constitutes cured cancer in the eyes of physicians conducting these clinics, and the number of cases that may be justifiably considered to be cured cancer cases?

Dr Chadwick A physician speaks of a cured cancer case as any individual who once had the disease and has

been free from it for at least five years. This period of time is chosen because if there is going to be a recurrence of the disease, it usually occurs within this interval. Therefore, the only cures obtained at our cancer clinics that can be considered are those that came between 1927 and 1933. More than 1000 individuals are included in this group. This group of cured cases from our clinics does not begin to measure all the cured cancers that have occurred within this same period, as only a small percent age of the individuals with cancer go to the Massachusetts Cancer Clinics. It is a conservative estimate that approximately 1000 individuals are being cured annually in this State. Will you tell of the call that came to your office recently concerning a cured cancer?

Dr Lombard That call was a very interesting one, and is, in a way, symbolic of what is possible in this State. The woman who phoned said she was aware of the work that the State was doing and wanted to help. She said her mother had been cured of a cancer fourteen years before and was now ninety years old, and was well and active. All the records of the case had been collected by these two public spirited women, including the original pathological slide with its cancer tissue. The woman who had been cured volunteered to appear at any of the cured-cancer clinics or to help in any way she could to publicize the curability of cancer. This demonstrates again the basic trait of the people of our Commonwealth—a sense of community responsibility, a willingness to work, without reward or recognition, for the common good. What other activities are going on in connection with the Cancer Program this month?

Dr Chadwick The tumor diagnostic service will receive specimens suspected of being cancerous from approximately 275 physicians. These specimens will be examined immediately upon their receipt and a detailed report will be despatched without delay to the physician who sent the specimen. This is a service that is conducted at no cost to physician or patient. The Pondville Hospital has 140 beds for the care of patients with cancer. The Westfield State Sanatorium has a 50-bed capacity for the care of cancer patients. The statistical or research section of the cancer division will continue its several studies on the various aspects of the disease. The *New England Journal of Medicine* will publish an important contribution to the literature from this department on the "Hereditary Aspects of Cancer," based on years of research. Two hundred and seventy five of the 355 communities in Massachusetts, which have already been enrolled in the Co-operative Cancer Control Committee Program, will hold more than 1000 group meetings attended by nearly 50,000 persons, and addressed by more than 1000 local physicians. This, in brief, is the program of "Cancer Month in Massachusetts—a State of nearly 4,500,000 inhabitants, nearly 7000 physicians, and 355 communities. Are there any measures to show just how effective this State Cancer Program really is?

Dr Lombard The most effective measure of the significance of the Massachusetts Cancer Program is the concrete evidence that more individuals are going to their physicians as soon as they notice an abnormality. The percentage of individuals who sought the advice of their physicians within the first month of the disease has increased from 12 per cent in 1933 to 18 per cent in 1937. The average delay of all patients has decreased from more than six months in the first nine years of the program to five months in 1936 and 1937. To be sure, five months is a long period for an individual with cancer to delay

11 00 a. m.

Introduction of Visiting Delegates

Blood Dyscrasias J. H. J. Upham, Columbus, Ohio,
President American Medical Association.

2 00 p. m.

*Report of House of Delegates**Report of Trustees*

Diagnosis and Treatment of Intra-oral Cancer Hayes
E. Martin, New York City

Discussion opened by
George C. Wilkins, Manchester

Treatment of Arthritis Walter Bauer, Boston.

Discussion opened by
Ezra A. Jones, Manchester
Lawrence R. Hazzard, Portsmouth

6.30 p. m.

THE BANQUET

Anniversary Charman Chester F. McGill, Portsmouth

*Introduction of President-elect**Guest Speakers*

Dr. Samuel T. Ladd, *president* New Hampshire
Medical Society

Dr. J. H. J. Upham, *president* American Medical
Association.

*Ladd's Lads**Manchester String Ensemble*BOARD OF REGISTRATION
IN MEDICINE

Twenty candidates presented themselves at the meeting of the Board held on March 10. Eight candidates were permitted to take the written examination in which all were successful.

The annual directory of physicians licensed to practice in the State has been published. Copies may be obtained from Miss Harriet Parkhurst, State House, Concord, or from the secretary, Dr. Fred E. Clow, Brown House, Wolfeboro. The Board requests that physicians consult this list with a view to preventing practice by unlicensed persons. Recently a physician from a nearby state has maintained an office from which he has treated many patients, wholly without permission or legal authority. Infractions of the Medical Practice Act will be promptly reported to the county solicitors, once they are called to the attention of the Board or its investigator.

COMMITTEE ON CONTROL OF CANCER

The following letter has been mailed to all physicians in the state:

During and following the educational campaign of the Women's Field Army, you may be consulted by patients asking you to decide whether they have cancer. In order to assist you in such an examination, the following suggestive guide has been formulated:

1. Examine lips, buccal and pharyngeal membranes for ulcerations or nodules, and the cervical lymphatic areas for nodular enlargement.
2. Any patient with unexplained hoarseness, of over one week's duration, should be examined by an expert laryngologist.

3. Examine skin for new growths, bleeding ulcerations or scaly dry crusts. Black moles need special consideration and expert advice.
4. Examine female breasts (and occasionally male) for lumps and for serous or bloody discharge from nipple.
5. Inquire minutely into symptoms of digestive disturbances, and if you cannot relieve them in a very short time, advise x-ray examination.
6. Examine carefully any patient with fairly rapidly increasing constipation, including digital rectal examination, stool examination for occult blood, and if indicated, an x-ray barium enema.
7. Rectal bleeding demands, first, digital examination, if no diagnosis can be made, then examine by proctoscopy. If no cause for bleeding is found with these two methods, then an x-ray barium enema should be advised. A barium enema should never be given until the rectum has at least been examined digitally.
8. Bimanual pelvic examination should be made in all women as a routine procedure. Note mobility, size and shape of uterus, appearance of cervix with especial attention to erosions. Note enlargement or tenderness of adnexa. If there is a history of abnormal bleeding, not definitely accounted for by the above examination, advise a diagnostic curettage.
9. If the patient has had urinary bleeding, advise immediate cystoscopy.
10. General examination should include the chest (if there is cough), abdominal palpation, and the examination of subcutaneous tissues and bones for possible tumors.

If the above rules are adhered to in making a physical examination, it is certain that fewer early cancers will be overlooked. Always remember that the fate of the cancer patient rests with the physician first consulted.

DISTRICT SOCIETY NEWS

Officers of the Belknap County Medical Society for 1938 are Dr. Harry Cbeney, president, Dr. M. Alice Normandin, vice president, and Dr. Clifford S. Abbott, secretary-treasurer. The next meeting will be held on April 12, with Dr. J. Russell Perley in charge of the program.

NOTES

Dr. George R. Eades, school physician, gave a lecture at a Parent-Teachers Association meeting at Keene on "Keeping the Child Well. Value of health clinics."

The quarterly meeting of the New Hampshire Graduate Nurses Association was held at the Elliot Community Hospital, Keene, under the presidency of Miss Ruth Whitcomb, of Concord, on March 15. The principal address was given by Mrs. Evangeline Morris, of the Simmons College faculty. Miss Marion Northway, of Milton and Mrs. Melanie Proulx, of Manchester, were nominated for membership on the State Board of Nurse Examiners. Sectional meetings of public health nurses, private-duty nurses and the League of Nursing Education were held in the morning. It was voted that the annual meeting be held in Manchester next June.

FISKE — EUSTACE L FISKE, M.D., of 807 E. Windsor Road, Glendale, California, died March 20. He was in his seventy ninth year.

Dr Fiske was graduated from Harvard Medical School in 1886. He was a fellow of the American Medical Association and the Massachusetts Medical Society.

PIKE — FORREST W PIKE, M.D., of Stoneham, died December 31, 1937. He was in his eightieth year.

He was a native of Stoneham and received his early education there. After receiving his degree from the University of Vermont College of Medicine, he served his internship in Poughkeepsie, New York, beginning private practice in North Chelmsford before finally settling in Portsmouth, New Hampshire. He practiced there for over thirty years, retiring twelve years ago.

Dr Pike was a fellow of the Massachusetts Medical Society and a member of the American Medical Association. He was a member of the Masonic Order.

Four nieces and two nephews survive him.

NEW HAMPSHIRE MEDICAL SOCIETY

ONE HUNDRED AND FORTY-SEVENTH ANNUAL MEETING

HOTEL CARPENTER, MANCHESTER, N. H., TUESDAY AND WEDNESDAY, MAY 17-18, 1938

MONDAY, MAY 16

7 30 p. m. D.S.T.

HOUSE OF DELEGATES

Speaker, Richard W. Robinson, Laconia.

Vice-speaker, William J. P. Dye, Wolfeboro.

Delegates from New England Societies

Maine Charles W. Kinghorn, Kittery.

Vermont Sam Sparhawk, Burlington.

Massachusetts

Daniel J. Ellison, Lowell.

Henry F. Dearborn, Lawrence.

Rhode Island

Auray Fontaine, Woonsocket.

Francis H. Chafee, Providence.

Connecticut

Thatcher W. Worthen, Hartford.

William E. Carroll, Meriden.

* * *

TUESDAY, MAY 17

9 30 a. m. D.S.T.

ROUND TABLE CONFERENCES

- 1 *Medicine* *Symptoms and tests of the failing kidney*
Bruce Snow, Manchester

- 2 *Surgery* *Infections of the hand*
Clinton R. Mullins, Concord.

- 3 *Industrial Accidents*

Emery M. Fitch, Claremont.

- 4 *Orthopedics* *The internist and his orthopedic problems*

Fred E. Clow, Wolfeboro.

11 a. m.

ROUND TABLE CONFERENCES

- 1 *Medicine* *The simplification of laboratory diagnosis for the general practitioner*

Harold D. Levine, Bristol.

- 2 *Surgery* *Sympathetic surgery in peripheral vascular disease*

M. Dawson Tyson, Hanover.

- 3 *Obstetrics* *Work of Maternity and Infancy Committee*

Benjamin P. Burpee, Manchester.

- 4 *Dermatology* *Treatment of common skin diseases.*

J. Harper Blaisdell, Boston.

2 00 p. m.

Presentation of 50 Year Membership Gold Medals to

Alpha H. Harriman, Laconia.

Frederick L. Hawkins, Meredith.

Henry O. Smith, Hudson.

Symposium on Thoracic Disease

- a *Treatment of Pneumonia* Frederick T. Lord, Boston.

Discussion opened by

Francis H. Nolin, Claremont.

Harold D. Levine, Bristol.

- b *Cancer of the Lung* Donald S. King, Boston.

Discussion opened by

M. Dawson Tyson, Hanover.

- c *Empyema* Edward D. Churchill, Boston.

Discussion opened by

William J. P. Dye, Wolfeboro.

Surgical Diseases of the Extrahepatic Bile Ducts I. S. Ravdin, Philadelphia.

Discussion opened by

Walter H. Lacey, Keene.

Chester L. Smart, Laconia.

* * *

WEDNESDAY, MAY 18

9 30 a. m. D.S.T.

ROUND TABLE CONFERENCES

- 1 *Medicine* *Diseases of the liver*
Leslie B. Copenhaver, North Woodstock.

- 2 *Surgery* *The acute abdomen*
Herbert L. Taylor, Portsmouth.

- 3 *Ear, Nose and Throat* *Every-day problems*
John A. Hunter, Dover.

- 4 *Pediatrics* *Preventive medicine*
Ursula G. Sanders, Concord.

1739

May 25 To Medicines & Attendance on yr
wife & Children to Jan^r 21st } 1 12 6

Feb^r 14 To Terebinth Venet. 3i 1/ } 0 1 —

2.14 6

Salem March 17th 1739

Rec^d in full of y^c Above Acco^t

p John Cabot Jun^r

5

1741 Capt. Joseph Bowditch to Jn^o Cabot Dr

July 23nd To Medicines & Attend^e on y^r Famuly }
to Decem^r 8th 1742 } £ 2 19 4

Rec^d in full of y^c above

p John Cabot

6

1743 Capt. Joseph Bowditch to John Cabot Dr

Apr^l 4 To Medicines & Attend^e on y^r Child at }
Several times to May 26th 1743 } £ 2 18 4

1744 To 1/2 yd Cloth &c. 1 16 4

4 14 8

Errors Excepted p John Cabot

7

Joseph Bowditch Esq^r to Eben Putnam Dr

To Visits & Medicine admin^d him from July
9th till Oct^r 21 1771 Three Pounds Three
Shillings & Four Pence - - £ 3 3 4

Err^s excepted

Eben Putnam

Rec^d y^c Above in full p Eben Putnam

8

1772 Joseph Bowditch Esq^r to David Mason

Feb 7 To the use of my Elictrical Machine &c. 0 12 0

David Mason

Feb^r 27th Cash pd. Mason s Son 12/

9

Dear Sir,

George is rather heavy to day from being broke of his
rest last night—the Symptoms of the disorder how
ever are entirely off, & I expect after a nights sleep
to find him well—

Ichabod has passed thro the easiest of either—

Benj s Symptoms come on last & he still feels more
of them than the others—I expect he will have the
largest crop of pustles, I am not however apprehensive
at present of so many as to be troublesome—

Charlotte feels a litle of y^c Symptoms yet & will prob-
ably next to Benj have the most pock—

Yours with Respect

M L

(Endorsed) Docktor Little

Feb 7 1794

NOTES

1 Robert Ellis, surgeon, was the son of a surgeon, Edward Ellis, and the father of two surgeons, Edward and Thomas Ellis. In 1677 Edward Ellis, his father, is styled "chirurgeon" and in 1695 Robert Ellis is styled "barber chirurgeon, but later he too is called "chirurgeon. He lived in Boston at the corner of Winter and Newbury (now Washington) streets. The date of his death may be approximated through the fact that his will was dated February 23, 1719 and proved April 18, 1720¹

2 Zabdiel Boylston (1679-1766), of Brookline, is too famous for having introduced inoculation against smallpox into America to receive more than passing mention here. In the spring of 1721 Boston was invaded by smallpox from Barbados, the Rev Cotton Mather suggested to Dr Boylston that the Eastern practice of inoculation be tried, and two days later (June 26, 1721) Dr Boylston inoculated his first patient. Against the opposition of other physicians and of a thoroughly aroused mob, and at the risk of his life, he persevered, and probably inoculated about two hundred and forty persons in all, the mortality was reduced from 12 to 15 per cent to a little over 2 per cent²

3 Francis Gahman was born in Hamburg, Germany, during the 1670s, and was living as late as 1740³. He appears in Salem as early as August 24, 1702, on which date, "being presently bound out to sea in a voiage in the good sloop called *The Charles* whercof Capt. Peter Lawrence is present commander against y^c French and Spaniards", he assigned to Henry Sharp of Salem, painter, because of a debt of £44.7s.9d, his share of any prizes that may be taken by Capt. Lawrence, together with his clothes, medicines and surgical instruments⁴. In the summer of 1703 John Quelch, mate of the brigantine *Charles* threw the captain, who was ill, overboard, and assumed command as a pirate, returning to Marblehead in May, 1704. It was rumored that he had been joined by Capt. Larimore, of Cape Ann, who had previously been a respectable privateersman. When a group of pirates had been located on Cape Ann, an armed force was sent to catch them, and the judges rode to Salem and got more information from Doctor Gatchuman [probably Gahman], whom they sent to the Governor to make a report. The pirates were captured at the Isles of Shoals and duly hanged in Boston.⁵ Dr Gahman's part did not end here, for we find "1729 April 17 A petition of Francis Gahman, of Salem, Chyrurgeon, showing, that by order of this Government, 1704, Capt. Laramore and others were sent to England to receive their tryals, as accessories to Quelch's piracy, he was sent over with them, and in his passage was taken and carried captive into France and lost his cloathing, books, chyrurgeon s chest and instruments, to a considerable value, praying for such relief as the Court shall think proper Referred to the next May session."⁶ The year 1708 finds him back in Salem, for in that year he married Mrs. Lydia West,⁷ and later records about him are all of a peaceable and unexciting character—we find him signing a paper drawn up at a meeting of the proprietors of the common lands in 1713-1714,⁸ being paid for his share in building a stone wall along the Lynn line in 1723,⁹ bleeding a patient who kept a diary—James Jeffry—in 1724,⁹ and mentioned as a communicant of the First Church in Salem in 1734-1735¹⁰. His name has been regularly mis-spelled, but his two signatures on this receipted bill show its correct spelling. As to the items ceracloth" is apparently cerecloth or waxed cloth "Empr Matricie" is undoubtedly the emplastrum hystericum or Mutter Pflaster of the Ger-

Dr Sharples was guest speaker at a recent meeting of the Whitefield Woman's Club. In a discussion of 'Preventive Medicine' he gave a brief outline of the incidence of common diseases, and the work being done toward their prevention by private physicians and the federal, state and local health organizations.

MISCELLANY

MASSACHUSETTS TUBERCULOSIS LEAGUE

At the annual meeting of the Massachusetts Tuberculosis League, Incorporated, the following officers were elected for the ensuing year: Dr Frederick T. Lord, Boston, president; Clifton H. Hobson, Palmer, and Dr Francis P. Denny, Brookline, vice presidents; Arthur Drinkwater, Cambridge, treasurer; Rodney Spring, Boston, assistant treasurer; Arthur J. Strawson, Newtonville, clerk; Dr Henry D. Chadwick, the Rt. Rev. William Lawrence, Rabbi Harry Levi and Cardinal O'Connell were chosen honorary vice presidents.

The meeting was followed by a talk by Dr Lord on the prevention and control of tuberculosis in Massachusetts, and one by Dr Robert E. Plunkett concerning the preventive research work in tuberculosis being carried out by the New York State Department of Health.

NOTES

At the fifth annual meeting of the American Institute of Nutrition, Dr T. M. Carpenter, of the Carnegie Institution, Boston, was elected vice president and Dr Helen S. Mitchell, of Massachusetts State College, was made a member of the council.

Dr G. Philip Grabfield, associate in pharmacology, Harvard Medical School, was elected secretary of the American Society of Pharmacology and Experimental Therapeutics at a recent meeting in Baltimore.

During the week beginning April 18 at the Peter Bent Brigham Hospital in Boston, Dr Emil Goetsch, first resident surgeon, now professor of surgery at the Long Island Medical College, and Dr Francis G. Blake, first of now living resident physicians, at present Sterling Professor of Medicine, at Yale University School of Medicine, served respectively as surgeon-in-chief, pro tempore, and physician-in-chief, pro tempore.

CORRESPONDENCE

PERIODIC MEDICAL EXAMINATION OF ADULTS IN CONTACT WITH CHILDREN

To the Editor—Our attention has been called to an editorial under the title 'An Opportunity for the District Medical Society' in your issue of March 24, in which you have commented favorably upon a plan for periodic medical examination of adults in contact with children that is being promoted by this Society.

Your comments in my opinion very faithfully interpret the underlying purpose of this work and we should be glad to assure the district medical societies through your good offices that it would be a pleasure for us to be of service to any of those societies which may desire to have more explicit information on the subject of this program.

JAMES BRYAN, *Executive Secretary*,
Medical Society of the County of Westchester

171 East Post Road,
White Plains, New York.

MEDICINE IN COLONIAL MASSACHUSETTS

To the Editor—The following papers serve to throw a modest side light on the practice of medicine in the colony of the Massachusetts Bay.

HAROLD BOWDITCH, M.D.

520 Commonwealth Avenue,
Boston

* * *

1

Boston 1715

The Estate of Mr James Butler
to Robert Ellis is Dr Viz

By Former Acct ^r carried in	}	£ 2 5 0
-		
For medicens and Attendance in time of his last sickness	}	£ 1 3 2
		£ 3 8 2

(Received) Robert Ellis

2

The Estate of Mr James Butler Deceasd
to Zab Boylston is —

Dr

To Medicine Adminsd 10 th Attendance yo ^r family from	}	£ 3 6 11
Time to time { from 1711 April 12th to Dec ^r 1713 in practice & shop		
To Reducing a fracture y ^e Childs Choller bone & Cure	}	£ 0 15 —
		£ 4 01 11

Boston May 17th 1716

(Received) Rec d of Capt. W^m Bowditch & Mr
Jn^o Eustus Adminstr^r to y^e Estate of Mr James
Butler Deceasd the Sum of four pounds one
Shilling & 11^d and is in full

p Zab Boylston

3

For Francis Hamlens Wife Dr	
1729 May 10 to Drops & Ceracloth (r)	00- 5- 2
1730 to a Visit & Electuary	00- 7- 6
Decembr 3 to Empt ^r Matricie	00- 1- 6
to Attendance & Sp p fumig	00- 4- 8
	£ 00 s18 d10

Francis Gahtman
Chyrg

(Received) Francis Gahtman

4

1738 Capt Joseph Bowditch to John Cabot Jun ^r Dr		
Febr ^y 22 To Medicines & Attend ^c on yr Maid	}	
to March 19th		
		£ 1 1 —

1739

that the skin lesions were due to syphilis or tuberculosis. He administered intramuscular bismuth with marked improvement of the skin lesions, and advised a lumbar puncture which was refused by the patient.

Two weeks before her entry to the hospital the patient consulted another physician who found a doubtful Hinton test and gave her an injection of arsphenamine in an attempt to produce a 'provocative reaction.' A second injection of arsphenamine was given one week later, and was followed by a shaking chill, three days of asthenia, and the sudden onset of weakness and collapse on the fourth day with complete loss of motor and sensory function in both legs and incontinence of urine and feces. She was immediately admitted to the hospital.

At the time of entry she was incontinent, her bladder was distended, the abdominal reflexes were absent, the knee jerks were markedly diminished, the Babinski reaction was present bilaterally, and there was ankle clonus. Sensation was absent below the buttocks posteriorly, and the groins anteriorly. Ten days after entry the reflexes of the legs were hyperactive, and the Babinski were still positive bilaterally. Two lumbar punctures yielded bloody fluid, thought to be due to trauma, the Wassermann reactions on both samples were negative. Four specimens of blood were taken. The Hinton test was doubtful in all four, while the Wassermann was positive in the first three and negative in the last. Tidal drainage of the bladder was instituted, and general supportive measures followed. There had been marked improvement, with return of most sensory and a great deal of the motor function. The knee jerks were still hyperactive, and the Babinski were still positive.

Dr C. Sidney Burwell stated that although the time relation between the injections of the arsphenamine and the transverse myelitis was impressive the mechanism of the production of the lesion was not understood. The arsenic may have produced its effect by direct action on the spinal cord, or by causing in an area of syphilitic inflammation an acute edema with partial or complete arteriolar occlusion and secondary spinal-cord change. Arsenic may also cause acute damage to the arteriolar wall itself, and hemorrhagic lesions are occasionally produced. In addition to transverse myelitis, acute hemorrhagic encephalitis may follow the administration of arsenicals. The prognosis in the present case was believed to be favorable.

The remainder of the evening's program was presented by Drs. Richard P. Strong, Henry Pinkerton and David Weinman who spoke on "Medical Investigations in Peru in 1937." Dr Strong briefly outlined the historical development of our knowledge of the etiology of yellow fever, and the mechanism of its transmission.

Sanarelli in 1897 reported that an organism, *Bacillus icteroides* caused the disease, and although this claim was confirmed by several investigators in the United States, it was later disproved. In 1900, Reed, Carroll, Lazear and Agramonte established the fact that the infective agent was present in the blood and that yellow fever is transmitted by the mosquito, *Aedes aegypti*. Although subsequent work (1905) showed that the virus was filterable, in 1909 Seidelin reported in the red cells an organism which he named *Paraplasma flavigenum*. Tyzzer, Sellards, and Dr Strong were unable to find these structures in the red cells when they studied yellow fever in Guayaquil in 1913. Also, they were unable to cultivate any organism from the blood though they used Noguchis spirochetal media of that time. Noguchi, however, also working in Guayaquil, believed that he had found the causative organism in 1918 when he demon-

strated and cultivated *Leptospira icteroides* from guinea pigs inoculated with the blood of jaundiced patients. Later investigations showed that this organism was identical with that causing epidemic jaundice (Weil's disease), and that perhaps the patients used by Noguchi were suffering from the latter disease and not yellow fever, or that the guinea pigs were infected with hemorrhagic jaundice. The present belief is that yellow fever is caused by a filterable virus.

Until 1932 yellow fever was believed to be especially a coastal disease and to affect particularly the population of our large seaports. Its favorable haunts were squalid low lying areas with open drainage systems and heavy mosquito infestation. It was thought to be essentially a mosquito-borne disease. Rarely was it known to extend far inland or to ascend high altitudes.

However, in 1932 Soper and his associates of the Rockefeller Foundation called attention to the discovery of yellow fever in Brazil and elsewhere in South America, in rural areas or sparsely populated jungle districts, and, importantly, in the absence of *A. aegypti*. A number of outbreaks have been reported in the past few years, and a few at altitudes of 2000 feet or over.

While in South America in 1937, Hanson and Dr Strong were asked to investigate an epidemic that was occurring on a coffee plantation on the eastern slopes of the Andes, at an elevation of 2500 feet. The nature of the epidemic was unknown. A study of the epidemic was made and an autopsy on a fatal case revealed the typical saffron-ocher liver with slight nutmeg mottling, the hemorrhagic gastritis with clots of dark blood in the stomach and duodenum, and the acute parenchymatous nephritis, which, together with the subsequent study of sections of the organs, established the diagnosis of yellow fever. Diligent search failed to reveal the presence of *A. aegypti* or other possible insect vectors for the disease. No explanation of the mode of transmission of the disease in inland regions has yet been found, though it is a problem which the Rockefeller Foundation is still studying.

The expedition to Peru in 1937, as was the expedition of 1913, was organized for the purpose of studying Oroya fever or verruga peruviana. This disease was referred to over four centuries ago when the Portuguese and Spanish invaders of Central and South America were said to be afflicted with it, and to suffer a high mortality. De la Vega stated that one quarter of Pizarro's forces succumbed to its ravages. The disease is characterized by fever, anemia and an eruption upon the skin. Often two stages are observed: in the first, Oroya fever, there is fever and marked anemia, in the second, verrugous lesions appear, sometimes only the second stage is apparent. If the patient survives the first stage of the disease, later a miliary eruption may occur, and subcutaneous, cherry-red, easily bleeding nodules develop, which may later become 7 or 8 cm. in diameter and tend to become eroded.

Barton in 1909 described bodies in the red blood corpuscles which he thought were probably the cause of the disease. In 1913, Tyzzer, Sellards and Dr Strong observed these bodies, and after studying them, believed they were parasitic, in honor of Barton, they named the organism *Bartonella bacilliformis*. The organism is rod shaped or rounded. The rods measure 1.5 to 2.5 μ in length, and the rounded form 0.5 to 1 μ in diameter. The anemia is frequently very severe and fatal. The red blood cells may be less than 1,000,000 per cubic millimeter. In severe cases over 90 per cent of the red cells are invaded by the parasite. The anemia is macrocytic in type, with marked anisocytosis and poikilocytosis, and the appearance of normoblasts and megaloblasts.

mans, the curious may learn its composition in Dr Woyt's *Gazophylacium Medico-Physicum* (1751)

4, 5, 6 Dr John Cabot was the son of John Cabot of Salem, merchant. He was born in Salem in 1704, took the degree of A.B. at Harvard in 1724 and that of A.M. there in 1727, was placed twenty-first in his college class of forty, and was engaged in the practice of medicine in Salem by 1729. He died in Salem in 1749 leaving a widow and two young children, the latter died in 1750 and 1759, so that he left no descendants.^{8, 11, 12}

7 Ebenezer Putnam, originally of Danvers, received the degree of A.B. at Harvard College in 1739 and that of A.M. in due course, he was placed seventeenth in a class of thirty-two. By the year 1744 he was practising medicine in Salem, where he joined the First Church and was chosen presiding elder on the death of Judge Ropes. He and Dr Edward Augustus Holyoke, both "loyalists of the passive sort," were men of high standing in the community. In 1760 both are found among the founders of the Social Library. He died in 1788.^{8, 11, 12} His patient, Capt. Joseph Bowditch, was paralysed for the last nine years of his life, as he died in 1780 it seems likely that the date of Dr Putnam's first visit, 9 July 1771, was that of the stroke.

8 Colonel David Mason, the owner of the electrical machine, was an important figure in Salem, and took a prominent part in the episode at the North Bridge in 1775, when Colonel Leslie was obliged to retreat to Marblehead without capturing the guns which Colonel Mason had been instrumental in obtaining for the patriot party. He was a student of electricity and a friend of Benjamin Franklin, although some twenty years his junior.¹³ This is no doubt an early instance of the use of electricity for paralysis.

9 Moses Little took the degree of A.B. at Harvard in 1787 and that of A.M. in 1804, he died in 1811.¹² There is nothing to show that this Moses Little was a physician, but a letter from a correspondent in Salem, writing June 2, 1811, says "Doctor Little is confined to his chamber & says that for sometime past he has expected to die, but did not think he should have fallen away so fast." The correspondence of dates makes it practically certain that we are dealing with the same man. He might have attended the medical school in Boston, for the first class was graduated from there in 1788, but the apprentice system, which Dr Little no doubt followed, was long in coming to an end. The internal evidence shows that this letter was written to Capt. Ichabod Nichols, of Salem, concerning four of his children who were no doubt under Dr Little's care for inoculation against smallpox. The ages of the children may be of interest. George was sixteen, Ichabod ten, Benjamin eight and Charlotte six. All recovered, and died at the following ages. George at eighty-seven, Ichabod at seventy-five, Benjamin at sixty-two and Charlotte at eighty-four.

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- 3 *Historical Collections of the Essex Institute* Vol. 8. 267 pp. Salem: Essex Institute Press, 1868.
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- 7 *The New-England Historical and Genealogical Register* Vol. 7 388 pp. Boston: Samuel G. Drake, 1853.
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- 11 Briggs L. V. *History and Genealogy of the Cabot Family 1475-1912* 887 pp. Boston: Charles E. Goodspeed & Co. 1927.
- 12 *Harvard University Quinquennial Catalogue of the Officers and Graduates 1636-1930* 1463 pp. Cambridge: Harvard University 1932.
- 13 *The Essex Institute Historical Collections* Vol. 48. 393 pp. Salem: Essex Institute, 1912.

REPORT OF MEETING

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital Tuesday evening, January 25, Dr S. Burt Wolbach presiding.

The surgical case was presented by Dr James B. Blodgett. The patient, a fifty-five-year-old Russian salesman, was first seen in the outpatient department two and a half months previously, at which time he complained of an inguinal hernia and of a chronic cough, both having been present for fifteen years. An x-ray taken at that time revealed a substernal mass and a triangular shadow in the periphery of the left lung field. The latter shadow was interpreted as a classical infarct of the lung. An x-ray taken one month later showed the triangular shadow to be larger, and he was hospitalized. At that time it was learned that he had suffered from weakness for the eight months preceding entry, and had lost 10 lb in weight. Physical examination revealed a substernal mass which moved with deglutition, a few rales in the left chest, and a right direct inguinal hernia. Roentgenograms showed an increase in the size of the shadow in the left chest, the edges of which were rounded, suggesting a neoplastic process. The basal metabolic rate was +66, the cholesterol 235 mg per cent, and the white-cell count 14,000. In spite of the markedly elevated basal metabolic rate there was no clinical evidence of thyrotoxicosis. The thyroid gland was removed for histologic study and relief of pressure symptoms, which the patient had experienced for a short time.

Dr Elliott C. Cutler, in commenting on the case, stated that no definite diagnosis of the mass in the left chest could be made, although metastatic carcinoma of the thyroid was a definite possibility. Dr Wolbach described the histologic picture of the removed thyroid, which appeared to be an embryonal adenoma in some areas, and a fetal adenoma in others. Such glands are not to be considered as true adenomas, but as a condition of compensatory hyperplasia. It is unusual for such a type of gland to give rise to metastases.

The second case was from the medical service. The patient, a twenty-eight-year-old, white housewife, suffered the sudden onset of transverse myelitis one month previously and was immediately admitted to the hospital. The past history was essentially negative. She had been married eight years, and had a seven-year-old child. Serological tests on both the husband and child were negative. Six months before entry to the hospital she consulted her local physician because of a persistent skin rash of one and a half years duration. Her physician found that during a routine examination at the age of fourteen years a positive Wassermann reaction and a negative Hinton test were discovered. No therapy was given at that time. Similar results (positive Wassermann and doubtful Hinton) were reported by the hospital at the time of her delivery seven years previously, but the serological tests were not repeated and no therapy was given at that time. Her local physician found that the Wassermann reaction was negative, and the Hinton test doubtful, and believed

CLINICS FOR CRIPPLED CHILDREN IN MASSACHUSETTS, UNDER THE PROVISIONS OF THE SOCIAL SECURITY ACT

CLINIC	DATE	ORTHOPEDIC CONSULTANT
Salem	May 2	Harold C. Bean
Lowell	May 6	Albert H. Brewster
Gardner	May 10	Mark H. Rogers
Haverhill	May 11	Arthur T. Legg
Brockton	May 12	George W. Van Gorder
Pittsfield	May 16	Francis A. Slowick
Springfield	May 18	Garry deN. Hough, Jr.
Worcester	May 20	John W. O'Meara
Fall River	May 23	Eugene A. McCarthy
Hyannis	May 24	Paul L. Norton

MASSACHUSETTS MEMORIAL HOSPITALS

The annual reunion of the House Officers Alumni Association of the Massachusetts Memorial Hospitals will be held on Saturday, April 23. The morning will be devoted to clinics by the medical, surgical, pediatric, obstetrical and outpatient departments and the staff of the Evans Memorial. These will start at 10:00, and will be followed at 12:30 by a luncheon and a business meeting.

The following papers by members of the staff will be read in the afternoon:

- 2:00-2:20 Two Cases of Leg Lengthening
Dr. Daniel M. Killoran.
- 2:20-2:40 Comparative Results with Different Methods of Handling the Appendiceal Stump
Dr. Welman B. Christie.
- 2:40-3:00 Carcinoma of the Colon.
Dr. Clifford D. Harvey.
- 3:00-3:20 Osteomyelitis of the Frontal Bone.
Dr. Leighton F. Johnson.
- 3:20-3:40 A Fifteen Year Calculus Survey of the Massachusetts Memorial Hospitals.
Dr. Myron J. Hahn.
- 3:40-4:00 Recent Advances in the Treatment of Cancer
Dr. Thomas J. Anglem.
- 4:00-4:20 Radiation of Inflammatory Lesions.
Dr. George Levene.
- 4:20-4:40 Parathyroid Tumors.
Dr. Louis G. Howard.

Cocktails will be served at the Hotel Kenmore from 5:20 to 7:00, to be followed by the annual banquet.

THE MASSACHUSETTS PUBLIC HEALTH ASSOCIATION

The April meeting of the Massachusetts Public Health Association and its sections will be held on Wednesday, April 27, at the University Club, 40 Trinity Place, Boston.

The section meetings will start at 11:00 a. m. Luncheon will be served at 1:00 p. m., after which Dr. Cecil K. Drinker will speak on "The Spread of Infections in the Respiratory Tract."

The programs for the different sections are as follows:

BOARD OF HEALTH SECTION

The Preparation and Scope of a Municipal Sanitary Code. Dr. Murray P. Horwood.

LABORATORY SECTION

- The Laboratory Diagnosis of Virus Diseases. Dr. Sidney C. Dalrymple.
- New Developments in Milk Technology. Dr. Robert E. Bemis, and Mr. A. A. Robertson.
- Movies on Bacteriological Technic. Dr. Alice T. Marston.

CHILD HYGIENE AND PUBLIC HEALTH NURSING SECTION

- Business meeting
- The Outlook for an Appraisal of Nutrition. Dr. Harold Stuart.

ERNEST M. MORRIS, M.D., *President*,
G. DONALD BUCKNER, *Secretary*

AMERICAN HEART ASSOCIATION

The fourteenth scientific session of the American Heart Association will be held on June 10 and 11 from 9:30 a. m. to 5:30 p. m. in the Sir Francis Drake Hotel, San Francisco, California.

On Friday, June 10, the general heart program will be given, and on Saturday, June 11, the program of the Section for the Study of the Peripheral Circulation.

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Boston Medical Library on Monday, April 25, at 8:15 p. m.

PROGRAM

- Heart Disease in Pregnancy at the Worcester City Hospital. Dr. F. B. Carr, of Worcester.
- Electrocardiographic Changes in Vitamin B Deficiency. Drs. C. C. Dustin, H. L. C. Weyler and C. P. Roberts, of Providence, Rhode Island.
- Gall-Bladder Disease and Coronary Sclerosis. Dr. E. H. Drake, of Portland, Maine.
- A Case of Hemophilia with Hemopericardium as a Result of Trauma. Dr. C. C. Dustin, of Providence, Rhode Island.
- Clinical Observations on the Use of Quinidine. Dr. James Z. Naurison, of Springfield.
- Auricular Flutter. Report of an unusual case with some remarks about the history of our knowledge of this disorder. Dr. Frank T. Fulton, of Providence, Rhode Island.

Interested physicians and medical students are invited to attend.

JAMES M. FAULKNER, M.D., *Secretary*

COURSE IN OCCUPATIONAL DERMATOSES

During May, 1938, a course in occupational dermatoses will be given under the auspices of the Harvard School of Public Health. Lectures will be given on the clinical manifestations, aspects and so forth. Clinics will be held at the Massachusetts General Hospital, and at the offices of various insurance companies. Visits to some of the more important factories will be arranged, so that students may study industrial processes and preventive measures. The number of students will be limited to ten. Further information and registration blanks may be obtained from the Dean of the Harvard School of Public Health, 25 Shattuck Street, Boston, Mass.

In 1913 attempts to cultivate this organism, especially on Noguchi's spirochetal media of this period, were unsuccessful. However, Dr Strong and his associates were able to inoculate monkeys successfully with material from human verruga nodules, and to reproduce the characteristic nodules through a long series of these animals. A monkey and two rabbits inoculated intravenously with blood from a human case of Oroya fever with anemia, containing large numbers of *B bacilliformis* in the red cells, did not develop any verrugas, nor were other lesions found in them. Also, a man, who volunteered, was inoculated cutaneously with a human verruga nodule, and did not develop fever, anemia or *B bacilliformis* in the blood, but only a local verruga lesion. The results of such experimental work obviously did not demonstrate or permit the assumption upon a scientific basis that the pathologic processes involved in Oroya fever and the verruga stage of the disease were identical.

However, by 1926, Noguchi had greatly improved his leptospiral media which he had also used for the cultivation of protozoa, and in this year he was able to cultivate *B bacilliformis* from blood of Oroya fever cases sent to him in New York. Battistini was associated in this work. On the expedition of 1937, using this same media, Dr Strong and his associates were able to confirm and extend this work.

The disease is found only in regions lying between 2400 and 8000 feet in elevation, where the climatic conditions are peculiar—receiving little rain, and situated along the banks of small rivers. While the method of transmission has not been demonstrated there is some evidence which indicates that *Phlebotomus*, a small blood sucking sand fly, may be concerned in the transmission. Both Townsend and Shannon and several others have been in favor of the view of such transmission, and Shannon has recently made a very valuable epidemiological contribution to the subject. Dr Hertig is at present in Peru carrying on further observations in this connection.

Dr Pinkerton described the pathologic lesions of verruga peruviana, and the cultural characteristics of the Bartonellae. Histologically the verrugous lesions appear to be multiple rapidly growing hemangiomas, somewhat resembling the hemorrhagic sarcoma of Kaposi. Bartonellae can be demonstrated in the endothelial cells during the verrugous stage, and appear to be the cause of the tumors. Cutaneous lesions were produced in monkeys by using Bartonellae isolated from human cases suffering from the febrile stage, and cultured on Noguchi's medium. This suggested that the two stages of the disease, verruga peruviana, had a similar etiology. A comparative study of the viruses isolated from the acute febrile and the verrugous stages gave further support to the theory that both have a common etiology. As cultured in tissue culture both viruses had identical growth patterns within cells. Unlike the Rickettsiae, which grow only intracellularly, the Bartonellae will grow outside the cells of the tissue culture as well as within cells. The morphology of the Bartonellae as demonstrated by special staining methods in the tissue of cases of the febrile and verrugous stages was also found to be identical.

Dr Weinman described the characters of the Bartonellae, and the production of the various forms of Carrion's disease in monkeys. The verrugous and the anemic forms were both produced in *Macacus rhesus* monkeys by injecting organisms obtained directly from human beings with the anemic form of the disease, splenectomy prior to inoculation greatly facilitated the productions of the anemic form. Nine per cent of the persons studied in a Peruvian village where Carrion's

disease is endemic were found to be infected with Bartonellae, although they were without symptoms. Some of these individuals had never suffered from the disease; others gave a history of previous illness. This infected portion of the population may serve as a reservoir for the disease. Experimental asymptomatic infection of the monkey was also obtained. Peruvian guinea pigs from the endemic regions were found to be infected with Bartonellae, although investigation showed that these organisms were different in type from the human form. The natural means of transmission of the disease still remains undetermined.

NOTICES

HENRY JACKSON LECTURE

The Henry Jackson Lecture for 1938 offered by the New England Heart Association will be given by Louis Hamman, M.D., associate professor of clinical medicine, Johns Hopkins University School of Medicine, at 8 15 p.m. on Friday, April 29, at the Boston Medical Library. His subject will be "The Diagnosis of the Causes of Heart Failure."

The annual business meeting of the New England Heart Association will precede the lecture.

RADIO BROADCASTS

The eighth group of weekly broadcasts sponsored by the American Medical Association and the National Broadcasting Company concern hygiene. These dramatized health messages are intended to furnish supplementary material for health teaching in junior and senior high schools and are broadcast every Wednesday from 2:00 to 2:30 p.m. over the Red Network. The dates and subjects are as follows:

April 27—Healthier Babies. Daily routine of the healthy baby, medical supervision, feeding.

May 4—Healthier Mothers. General advice for the expectant mother, good for boys and girls to know about.

May 11—Hospitals Aid Health. The place of the hospital in the health program of the individual and the community.

May 18—Runabouts, 1938 Model. The preschool child and the health and personality problems of that age.

CANCER CLINIC

A cured-case teaching cancer clinic will be held at the Boston Dispensary on Friday, April 29, at 11 30 a.m., at which time a variety of cured cases will be shown and methods of treatment discussed.

Physicians are cordially invited to attend.

CAMBRIDGE HOSPITAL

The regular clinicopathological meeting of the staff of the Cambridge Hospital will be held at the Cambridge Hospital, 330 Mt. Auburn Street, on Tuesday, April 26, at 8 30 p.m.

Dr Stanley Nowak and Dr Stephen Maddock will discuss sudden death in liver disease.

All members of the medical profession are cordially invited to attend.

JOSEPH M. WADDEY, M.D., Secretary

tion R. C. Wingfield. 122 pp. Baltimore William Wood & Company, 1937 \$2.50

Fractures and Dislocations for Practitioners Edwin O Geckeler 252 pp Baltimore William Wood & Company, 1937 \$4.00

Step by Step in Sex Education Edith Hale Swift. 207 pp. New York The Macmillan Company, 1938 \$2.00

X Rays and Radium in the Treatment of Diseases of the Skin. George M. MacKee. Third edition, thoroughly revised. 830 pp Philadelphia Lea & Febiger, 1938 \$10.00

Scientific Contributions in Honor of Joseph Hersey Pratt on His Sixty-Fifth Birthday Anniversary Volume. By his friends. 983 pp Lancaster Lancaster Press, Inc., 1937

BOOK REVIEWS

Surgical Pathology of the Diseases of the Neck Arthur E. Hertzler 237 pp Philadelphia, Montreal and London J B Lippincott Company, 1937 \$5.00

This work is the tenth of Hertzler's monographs on surgical pathology. In the preface to this volume the author deplors "the present tendency to treat all lesions of the neck by irradiation without a definite pathologic diagnosis and adds what surgeons have learned is in grave danger of being lost by the practice."

He proceeds in a clear, concise and orderly manner to discuss not only the gross and microscopic pathology of the diseases of the neck but also their life history. The study is, therefore, of great practical value to the clinician and surgeon in the differential diagnosis of these conditions. To this end the many excellent illustrations are of valuable assistance. The pages carry 206 illustrations. Ninety-eight are pictures of patients showing the early and progressive appearances of the various diseases. The remaining cuts (except two roentgenograms of the chest) illustrate gross and microscopic pathology.

The subject is discussed under ten chapter headings: preview of surgical affections, Hodgkin's granuloma, lymphosarcoma, lymphoepithelioma, rare primary tumors, vestigial rests, benign tumors, salivary tumors, secondary tumors and inflammatory affections (Hertzler has dealt with diseases of the thyroid gland in a previous monograph.) Following each chapter is a short bibliography with appraisals by the author. The text is often colored by picturesque expressions.

The physical make up of the volume is attractive. The paper is highly calendered. The typography is excellent. The book merits a place on the shelves of every general surgeon.

Pathology of the Central Nervous System Cyril B Courville. 344 pp Mountain View, California Pacific Press Publishing Association, 1937

This book adequately covers the subject and, moreover, gives many new, fresh points of view in regard to the pathology of the nervous system. The author has been fortunate in having had at hand for statistical data and examination the brains and spinal cords in a series of 15,000 autopsies performed at the Los Angeles County Hospital. His book is the result of his labors in this field.

The usual aspects of the subject are covered: congenital anomalies, malformations, diseases of the blood vessels, infectious diseases, trauma, intoxications and tumors. Two chapters are worthy of special comment, the one on the infectious diseases of the nervous system covers the field

more adequately than any other textbook, and the same may be said about the section on trauma. A series of excellent illustrations of pathologic material, both gross and microscopic, plus many diagrams and drawings, illustrates the volume. Particularly useful are the drawings in the chapter on trauma, showing the mechanism of injuries to the nervous system, and those delineating the sources of metastatic tumors from other organs. As an appendix there is an unusual chapter on clinicopathological aphorisms, and the book closes with an adequate index.

Printed on rather heavy, shiny paper, the book is not particularly attractive typographically. The matter in it, however, is the product of a thoughtful, ingenious, painstaking individual and deserves wide reading. Although there have been a number of books on the pathology of the nervous system published in recent years, this volume, unique in character, deserves a place in every neurologist's library. The subject is, perhaps, a little oversimplified for the neurological expert, but for students it offers a splendid text.

Macleod's Physiology in Modern Medicine Edited by Philip Bard et al. Eighth edition. 1051 pp St. Louis The C. V. Mosby Company, 1938 \$8.50

This book appears in a new eighth edition, revised and largely rewritten by Prof. Philip Bard, of Johns Hopkins, with the help of eight collaborators, leaders in special physiological fields. In this edition, the section on the physicochemical basis of physiologic processes has been omitted, and the book as a whole contains less physiologic chemistry, allowing room for the expansion of other material. A satisfactory arrangement is the division into large and small type, some of the clinical applications, methods and more technical considerations being given in the small print.

From the clinical point of view, one notes that brief mention only is given the new precordial lead in electrocardiography. The old terms for right and left bundle-branch block are used, while the newer and exactly opposite interpretation, now generally accepted by clinicians, is only mentioned as a possibility.

This is not primarily a book on applied physiology, but a broadly based textbook. Its suitability, however, is by no means limited to medical students. Any practitioner, and particularly any clinician who pretends to master the field of his special interest, will find fundamental physiology brought up to date, together with adequate references to a further perusal of the literature.

The mutual dependence and indebtedness which exists between the so-called fundamental sciences and their clinical application is happily being recognized by both physiologists and practicing doctors. Prof. Henry C. Bazett closes the section on the circulation with the following words:

Physiology has something to contribute to medicine, particularly, perhaps, a scientific attitude, a meticulous attention to detail, and a more quantitative approach to the subject. But the contribution of medicine to physiology is no less important, for scientific medicine has contributed largely to the solution of the problem of vascular control in inflammation, to the study of excitation and conduction in the heart, and many other problems, sometimes in meticulous detail, sometimes in large outline of basic fundamental principles. When the pressing problem of hypertension is solved, it is as likely to be solved by the clinicians and to throw light on physiology, as it is to be solved by the physiologist and to throw light on medicine.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, APRIL 25

MONDAY APRIL 25

8 15 p m New England Heart Association Boston Medical Library
8 Fenway

TUESDAY APRIL 26

*9 10 a m Boston Dispensary Clinicopathological conference
Dr R. C. Wadsworth and Dr Cadis Plupps
*10 a m 12 30 p m Tumor clinic. Boston Dispensary
8 30 p m Clinicopathological meeting Cambridge Hospital

WEDNESDAY APRIL 27

*9 10 a m Boston Dispensary Hospital case presentation Dr
S J Thannhauser
11 a m Massachusetts Public Health Association University Club
Boston
*12 m Clinicopathological conference. Children's Hospital amphitheater

THURSDAY APRIL 28

8 30-9 30 a m Exchange visit surgical and orthopedic staffs of the
Peter Bent Brigham and Children's hospitals held this week at the
Children's Hospital *This is the last exercise for the season*
*9 10 a m. Boston Dispensary The Significance of the Heterophile
Agglutination Test. Dr Peter Beer

FRIDAY APRIL 29

*9 10 a m Boston Dispensary Social Security Professor E. B.
Wilson
*10 a m 12 30 p m. Tumor clinic. Boston Dispensary
*11 30 a m Cancer clinic Boston Dispensary
12 m Clinical meeting of the Children's Medical Service Massachusetts
General Hospital Ether Dome.
8 15 p m Henry Jackson Lecture, Boston Medical Library 8 Fenway

SATURDAY APRIL 30

*9 10 a m Boston Dispensary Hospital case presentation Dr
Thannhauser
*10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital
Conducted by Dr Henry A. Christian

SUNDAY MAY 1

4 p m Illustrated public health lecture, Faulkner Hospital auditorium
Progress in Dental Surgery Dr Kurt H. Thoma

*Open to the medical profession.

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p m, New Bedford

ESSEX SOUTH

MAY 5—Censors meet at Salem Hospital 3.30 p m.

MAY 11—Annual meeting Salem Country Club Peabody Dinner at
7 p m Speaker and subject to be announced.

FRANKLIN

Meeting will be held at the Franklin County Hospital, Greenfield, at
11 a. m. the second Tuesday of May

HAMPTON

Meetings will be held on the fourth Tuesday in April and July

HAMPSHIRE

MAY 11—Page 546 issue of March 24

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club Stoneham at 12.15 p. m.
on May 11

MIDDLESEX NORTH

Meeting will be held at the Vesper Country Club, Lowell, on April 27

NORFOLK DISTRICT

MAY—Annual meeting

The censors meet on the first Thursdays of May and November in each
year

NORFOLK SOUTH

MAY 5—Annual meeting at 12 noon.

PLYMOUTH

Meetings will be held at 11 a. m. on April 21 May 19 and July 21.

WORCESTER

MAY 11—Afternoon and evening annual meeting Place and schedule
of program to be announced

BOOKS RECEIVED FOR REVIEW

Handbook on Social Hygiene Edited by W. Bayard
Long and Jacob A. Goldberg 442 pp Philadelphia Lea
& Febiger, 1938 \$4.00

Treatment in General Practice Harry Beckman. Third
edition 787 pp Philadelphia and London W. B.
Saunders Company, 1938 \$10.00

How Ancient Healing Governs Modern Therapeutics
The contribution of Hellenic science to modern medicine
and scientific progress Kleanthes A. Ligeros. 523 pp.
New York and London G. P. Putnam's Sons, 1937
\$10.00

Introduction to Ophthalmology Peter C. Kronfeld.
331 pp Springfield, Illinois and Baltimore Charles
C. Thomas, 1938 \$3.50

The Thousand Forms of Disease R. P. Byers. 29 pp.
Boston Superuniversity Publications, 1938 \$1.50

The Biology of Pneumococcus The bacteriological, biochemical and immunological characters and activities of
Diplococcus pneumoniae Benjamin White. 799 pp.
New York The Commonwealth Fund, 1938 \$4.50

The Patient and the Weather William F. Petersen,
with the assistance of Margaret E. Milliken. Volume 4,
part 3 651 pp Ann Arbor Edwards Brothers, Inc., 1938
\$10.00

Physicians' Vitamin Reference Book Presenting to the
clinician a useful compendium of the latest facts about
vitamins Medical Division, Professional Service Department,
E. R. Squibb & Sons 126 pp New York E. R.
Squibb & Sons, 1938

Illness Its story and some common symptoms a guide
for the layman S. Henning Belfrage. 173 pp New York
Oxford University Press, 1938 \$1.50

Pulmonary Tuberculosis in Practice A modern concept

APRIL 22—Symposium in honor of Dr. Jelliffe. Page 583 issue of
March 31

APRIL 22—Massachusetts Society for Social Hygiene. Page 658 issue
of April 14

APRIL 23—Massachusetts Memorial Hospitals annual reunion of house
officers alumni association Page 707

APRIL 23—Symposium on pulmonary disease. Boston City Hospital
Page 659 issue of April 14

APRIL 25—New England Heart Association Page 707

APRIL 26—Lawrence Cancer Clinic Page 658 issue of April 14

APRIL 26—New England Society of Psychiatry Page 322 issue of February 17

APRIL 26—Clinicopathological meeting. Cambridge Hospital Page 706

APRIL 27—Massachusetts Public Health Association Page 707

APRIL 29—Cancer clinic. Page 706

APRIL 29—Henry Jackson Lecture. Boston Medical Library Page 706

MAY 12—Pentucket Association of Physicians Hotel Bartlett 95 Main
Street Haverhill 8 30 p m

MAY 16 and 17—American Neisserian Medical Society Page 582 issue
of March 31

MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical
Society Hotel Bradford Boston

JUNE 6 7 8 and 9—American Association of Industrial Physicians
Page 499 issue of March 17

JUNE 10 and 11—American Heart Association Page 707

JUNE 13-17—American Medical Association San Francisco

JUNE 13 OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology
Page 282 issue of February 10

SEPTEMBER 12-14—American Association for the Study of Goiter Page
545 issue of March 24

OCTOBER 17-21—Clinical Congress of the American College of Surgeons
New York City

OCTOBER 24 '36—Academy of Physical Medicine Scientific Session Wash-
ington D. C.

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STUDIES ON THE FAMILIAL ASPECTS OF CANCER

HERBERT L. LOMBARD, M.D.*

BOSTON

THE question of heredity as a predisposing factor to cancer has been a subject of interest to students of the cancer problem for several centuries. The first published opinion on this subject was Daniel Sennert's rejoinder to Zacutus Lusitanus, his seventeenth-century contemporary. Lusitanus evidently had stated that he had seen a case in which a girl had contracted cancer from her mother through hereditary "infection," and Sennert maintained that the disease could not be transmitted in this way.

Some cancer research workers feel that families in which multiple cancers have occurred furnish one proof for the hypothesis that cancer is hereditary, others assert that such findings are merely the phenomena of chance. A perusal of the literature yields several records of identical twins who had developed cancer. This has been presented as additional proof that cancer is hereditary. Innumerable physicians who occasionally have noticed cancer in two successive generations have felt that no further proof of the hereditary nature of cancer was necessary.

Animal experimentation has made possible the observation of morbid conditions in consecutive generations under ideal circumstances. Through close, long-continued inbreeding, strains of animals with a very large percentage of cancer among their offspring and strains with practically no cancer among their offspring have been produced. The fact that these results may be obtained more or less at will in expert hands under authentic laboratory conditions has convinced many that hereditary influence must be present in animals, and from this premise the assumption is made that the human race is similarly affected. Some individuals question any hereditary predisposition to cancer, others agree that there may be such a tendency and if the human race could be subjected to the eugenic selectivity of the laboratory, it could be demonstrated. Under the existing habits of the human race, inbreeding is such a relatively rare

phenomenon that a predisposition to cancer, based on heredity alone, becomes difficult to prove. Various statistical studies have been made, but their evidence is largely inconclusive.

The presentation to the public of this subject of heredity in cancer has been confused and inconsistent—on one occasion cancer is dogmatically stated to be a disease transmitted through heredity, on another it is specifically stated not to be transmitted in this way, on still another it is stated that for all practical purposes cancer is not hereditary. Heredity as an abstract phenomenon has no particular appeal, nor do the theoretical aspects of the case attract the interest of the general public. Whether an individual has a greater chance of developing cancer because a parent had the disease is the real problem.

With the full realization of the paucity of available material and of the obstacles inherent in the collection of statistical material of this kind, the Massachusetts Department of Public Health began seven years ago the collection of data with the intention of increasing the knowledge of this problem. An effort was made from the beginning to compensate for the statistical fallacies that were anticipated. Four approaches to the problem, which involved the use of two different sets of data, were made. The first set of data was obtained from the Massachusetts mortality records from 1841 to 1932. The second was taken from another study which dealt with the association between cancer and varied environmental factors.

In the first series of data, ten towns with a combined population in 1930 of 21,979 were selected. These communities were chosen because they were the type of community which had been conducive to permanent settlement and had witnessed the life span of generation after generation of the same families, and because over the period studied the quality of medical service had been high. Death records of all individuals above the age of twenty were copied. Family trees were constructed from these records. Each separate family tree listed

Health Under the "El" The story of the Bellevue Yorkville Health Demonstration in mid town New York
C E A Winslow and Savel Zimand. 203 pp New York and London Harper & Brothers, Publishers, 1937 \$2.25

In this book with illustrations, charts and tables, Winslow and Zimand describe the health demonstration that was conducted in the Bellevue Yorkville district of New York City over a ten year period. The area of this district was approximately 9 per cent that of the entire city, and the permanent population comprised a similar proportion. During the day a large influx of individuals from other localities came into the district and were subjected to some of the health hazards of the permanent residents. The demonstration was financed in part by the existing agencies and in part by a grant from the Milbank Foundation.

The objectives of the demonstration were

- 1 To apply to a given area known facts about the prevention of disease.
- 2 To interest the district in the improvement of its health
- 3 To further develop, by careful analysis and research, methods of public health administration that are practical and useful in a city of the first class.
- 4 To supplement existing health agencies, both public and private, to such an extent as to make their facilities reasonably adequate to meet the needs of the population. This implies a health program for the district that, if successful, may be applicable to the whole city and to other urban areas
- 5 To integrate the work of the demonstration so thoroughly with the Health Department and other agencies that the gains of the demonstration will be conserved after the demonstration itself is completed

At the close of the ten year period, substantial improvements in the health conditions of the district were noted. The tuberculosis rate had dropped, the typhoid rate had dropped, and no diphtheria cases occurred in 1933. Infant mortality showed a marked decline.

The practicing physician was considered in planning the demonstration. Dr Charles G Heyd said. It seems to me in a far larger sense the usefulness of the Bellevue-Yorkville demonstration has been that it is the first concrete example of the introduction of the medical profession into an ideal set up for health service.

Success of the projects planned to stimulate and aid in the practice of truly preventive medicine of the private physician was less complete than had been hoped. The graduate course offered to physicians in the technic of making general physical examinations was discontinued. The service of the contact worker who visited physicians in their offices to discuss with them ways of increasing their preventive practice was also discontinued. The general practitioners did not make use of laboratories which were made available to them to any great extent. Nurses were furnished to physicians to help them in furthering preventive work. Only a few physicians availed themselves of this service.

Winslow and Zimand state

What triumphed at Bellevue Yorkville was not merely an administrative technic, but an ideal, and an ideal by no means limited to the field of health. It was the basic ideal of democratic government.

In one sense, the Bellevue Yorkville demonstration was impermanent. Already, external evidences of its existence are passing. The personnel has been

scattered, the building may be converted to other uses. In its technical details, too, the work will pass.

In another sense, however, the work is lasting. Bellevue-Yorkville was not, after all, concerned mainly with introducing specific types of public-health work, with demonstrating the value of a particular method of procedure, a type of equipment. Its function was more basic. These changing, impermanent features were only the tools with which it worked—the means it used to carry out its fundamental purpose, which was, in its essence, an educational process for attaining an ideal of social co-operation.

One cannot help but wonder if this plan had taken into account to a far greater extent than it did the physicians in the district,—if it had been based more on the line of the Hunt plan,—if the results might not have been better.

Regardless of whether one is sympathetic with the undertaking, this book should be read by all students of medicosocial economic problems, as it offers one method toward their solution.

The Complete Pediatrician Practical, diagnostic, therapeutic and preventive pediatrics Wilburt C. Davison. Second edition 243 pp Durham, North Carolina Duke University Press, 1938 \$4.00

Here is a book small enough to carry easily in one's professional bag but which contains, nevertheless, about as much practical pediatric information as can be found in any book in the language. Included are discussions of some 329 diseases, 213 laboratory procedures and therapeutic technics, outlines of the principles of growth, development and child guidance and, for the less experienced, directions for history taking and the making of examinations.

But notwithstanding its comprehensiveness, its accuracy and its up-to-dateness this will not become every man's book. The arrangement of its matters is unusual and perhaps at first glance puzzling. And though no great effort is required to learn how to use it properly, there will be some (the reviewer is not including himself among the number) who will never learn to like it. Diseases are arranged in groups not on the basis of etiology but according to the anatomical system—respiratory, gastrointestinal, circulatory, neuropsychiatric, and so forth—through which their objective manifestations are most characteristically expressed. One in pursuit of a diagnosis proceeds from signs and symptoms to the disease and thence, it may be, to laboratory tests by which the diagnosis may be confirmed or rejected. In short, the approach is much the same as in using an index of differential diagnosis. If one be constitutionally inimical to such approach this book is emphatically not for him, if the method appeals he will come to value Dr Davison's work very highly.

The potential user should be assured in any case, however, that this second edition, entirely rewritten, is much easier to manage than was the first, the paragraph numbers have been reduced from some 1100 to about one fifth that number, thus greatly facilitating the pursuit of cross-references.

In preparing this book the author drew on no less than 7500 articles in various medical journals, but in order not to encumber the text with additional numbers the bibliography has been separately printed. It may be obtained from the publishers for fifty cents and may be inserted in the book at the option of the reader.

According to this method, if one cancer occurred in the family tree, there would be an 11.3 per cent probability of another case's occurring. The actual occurrence was 12.2 or a rate about 1 per cent greater than was expected.

The second type of data used was a part of a separate study dealing primarily with the association of various environmental factors and cancer. This study was financed in part by the Rockefeller Foundation. Histories were obtained from 249 women with cancer of the cervix and 250 with cancer of the breast, and from controls with similar age distributions. These women were all living and voluntarily had answered many questions regarding their life history. Only individuals willing to co-operate were included in the study. Each woman was questioned regarding the cause of death or sickness of grandparents, parents, brothers and sisters. Living relatives, unless they had been diagnosed by physicians as cancer patients, were classified as non-cancer, although the probability was recognized that some of them might later develop this disease. The information regarding grandparents was inadequate and the hereditary history was limited to the immediate family group, that is, the father, mother and children.

Of the 249 individuals with cancer of the cervix, 51 had either a parent or a brother or sister with cancer, while of the 249 controls, 44 had relatives with cancer. Of the 250 women with cancer of the breast, 53 had either a parent or brother or sister with cancer, while of the 250 women who were used as controls for this group, 43 had a parent or a brother or sister with the disease. The differences were not significant, but pointed in the same general direction as the other data.

CONCLUSIONS

All the methods used point toward some hereditary tendency to cancer. They do not indicate whether all cancer is hereditary. The statistical means at one's disposal makes this impossible. A general hereditary susceptibility may or may not be present. This study merely indicates that individuals among whose immediate relatives cancer has occurred have a slightly greater chance of contracting the disease than has the remainder of the population. The difference between the two groups is not sufficient to cause undue worry, but indicates, without any question, that further statistical studies on this problem are desirable.

100 Nashua Street.

PERITONEOSCOPY

EDWARD B. BENEDICT, M.D.*

BOSTON

PERITONEOSCOPY is the direct inspection of the abdominal and pelvic cavities by an endoscopic instrument. Cystoscopes have frequently been used for this purpose, and numerous modifications have been developed. Various names have been applied to the procedure, including celioscopy, ventroscopy, laparoscopy, organoscopy, abdominoscopy and splanchnoscopy. Although this examination is generally called *Laparoskopia* in Germany, here it is usually known as peritoneoscopy. In 1901, at the Seventy-Third Congress of German Naturalists and Physicians at Hamburg, Kelling¹ first demonstrated *Kölhoskopie* in a dog. He later used the method in human beings. From 1910 to 1914 Jacobaeus² published several papers on laparo-thoracoscopy, citing the usefulness of the method in cirrhosis, syphilis, Pick's disease, metastatic tumors and tuberculous peritonitis. In 1925 Nadeau and Kampmeier³ published a comprehensive review of the literature, briefly citing the experiences of some twenty authors from 1910 to 1925. Reference is also made to many of these writers by Ruddock,^{4, 5} who is chiefly responsible for the re-

cent revival of interest in this subject in the United States. Ruddock has examined over 500 cases by this method, and reports the peritoneoscopic accuracy of diagnosis as 91.7 per cent, as compared with a clinical accuracy of 63.9 per cent. Kalk⁶ has also written extensively on *Laparoskopia*, and although he points out the possible dangers of puncturing the bowel, injuring the viscera, infecting the peritoneum, spreading inflammatory processes and producing air emboli, he considers these possibilities to be very slight, reports no damage in 100 examinations, and concludes that the procedure is truly a "method without danger." Others who have written recently on the subject include Short⁷ (1925), Korbach⁸ (1927), Sweet⁹ (1927), Hanau¹⁰ (1932), Henning and Mancke¹¹ (1933), Fervers¹² (1933), Stolze¹³ (1934), de Laserna y Espina¹⁴ (1936), Anderson¹⁵ (1937) and Hope¹⁶ (1937). Anderson points out the possibility of (1) transillumination of the stomach, sigmoid, rectum and vagina, (2) implantation of radon needles and (3) electrocoagulation for sterilization of the female. Hope is enthusiastic about the use of peritoneoscopy in the differential diagnosis of ectopic pregnancy.

In a review of the literature we find that peritoneoscopy has been used in the following conditions:

*From the Massachusetts General Hospital.

*Assistant in surgery, Harvard Medical School and Massachusetts General Hospital.

the names of the ancestors, the date, age, and cause of death of all individuals found to have been members of that family

The total deaths at each ten-year age group and at each ten-year time interval were ascertained. The percentages of individuals that died of certain specified diseases were obtained. These percentages were applied to the individuals in the various age groups and time intervals to obtain an expected number of deaths for the causes studied. For example, the age group 60-69 in the time interval 1901-1910 would have for expected rates per unit—cancer 132, tuberculosis 050, heart disease .220, old age and ill defined 040, and all others .558—totaling 1. This represented the chance of dying of a given disease in a population of a given age group, all the members of which died in a given time interval.

Tabulations were then made showing the chance of dying of cancer or other diseases for all the known ancestors of individuals who had died of cancer. Similar tables were constructed for the ancestors of individuals dying of other causes. The summation of these tables furnished an expected number of deaths from various causes to be compared with the actual number of deaths from the various causes among ancestors of individuals with and without cancer. This method allowed for the grouping of data at different time intervals and age distributions, as well as the use of family trees of different lengths and structures.

The smallest family tree constructed consisted of one individual and one parent, the largest of the individual and twenty-three relatives. This method of classification made no allowance for collateral lines. A family tree started from the most recent death in a given line. There were some cases where two trees were almost identical because the initial individuals were brothers and sisters. The number of these was not great, for as a rule only one son or daughter remained in the native town. The record of one individual was counted as a cancer or non-cancer ancestor as many times as it occurred in this capacity, but was considered as the first person in a family tree only once.

	OBSERVED CANCER CASES	EXPECTED CANCER CASES
Known ancestors of cancer individuals	97.0	76.4
Known ancestors of non-cancer individuals	740.0	752.8
	OBSERVED CANCER RATES	EXPECTED CANCER RATES
Cancer rate per 100 among ancestors of cancer individuals	6.0	4.7
Cancer rate per 100 among ancestors of non-cancer individuals	4.7	4.6

Among the known ancestors of cancer individuals, the difference between the observed and the expected cancer cases showed significant positive association. A similar difference among ancestors of non-cancer individuals showed no significant

association. The expected cancer rates in the two populations were 4.7 and 4.6 respectively.* The observed cancer rate among ancestors of non-cancer individuals, 4.7, was consistent with the expected, but the observed rate among ancestors of cancer individuals, 6.0, was significantly greater. This method, which gives corrections for both the time element and the age factor, indicates that the rate is slightly over 1 per cent higher among ancestors of cancer individuals than would be expected.

Another method used in the analyses of these data was a computation of the percentage of known cancer children in families in which one or both of the parents had cancer. In this part of the study an additional community, with a population in 1930 of 8668, was added. The family trees were constructed in the same way as in the previous study, but the computations previously discussed were omitted due to the time element and the conviction that sufficient evidence of this type had been used.

Of 1129 families, one parent of whom had cancer, 10.5 per cent of the known children in the family trees had cancer. In 6741 families in which neither parent had cancer, the cancer rate among known offspring was 8.6 per cent. The difference between 10.5 and 8.6 indicates a cancer rate about 2 per cent higher among individuals with cancer parents than among those without the disease. In twenty-three families in which both parents had cancer, 13.0 per cent of the known children had cancer. The rate for families in which cancer occurred in both parents is based on a small population and is not well fixed. Still, it may point toward the possibility of a higher rate among such families.

Of the children of parents who had cancer, 12.6 per cent had a cancer of the same site as the parent, 29.5 per cent had cancer of a different site, and the sites were unknown in the remaining 57.9 per cent. The large number of unknowns was primarily due to the presence on the death certificate of the word "cancer" with no notation as to site. The large number of unknowns invalidates these figures, but when it is considered that 30 per cent of the children of cancer parents where the site was known had cancer of the same site, and 70 per cent had cancer of a different site, there is a possibility that site of cancer is of importance.

The application of the binomial expansion to family trees of various sizes, using the cancer rate for each group of families, was another method used on these data. The expected number of cancers found in the total summation was compared with the actual and showed that multiple cancers were found slightly more often than would have been expected by a purely chance phenomenon.

The norm of 4.6 or 4.7 per cent is of course much lower than the present-day figure. This is due to the changing ratio over the years. The ratios in this study closely agree with those of Massachusetts on a year by year basis.

mors, ectopic pregnancy and ovarian dysfunction. In one case an excellent view was obtained of a polycystic liver, in another case of supposed echinococcus cyst, the liver was found to be normal, and in a third case where there was a questionable palpable mass, the peritoneal cavity was found to be normal.

Contraindications. Serious cardiac or pulmonary disease may be a contraindication, for the peritoneal distention necessary for a satisfactory examination may somewhat embarrass the circulation and the diaphragmatic movements. Numerous abdominal adhesions may constitute a contraindication, though it is usually possible to select a site for puncture at a safe distance from previous laparotomy scars. Because of the danger of spreading infection, peritoneoscopy is contraindicated in inflammatory conditions.

Relative Advantages of Peritoneoscopy and Exploratory Laparotomy. Peritoneoscopy is a minor procedure performed under local anesthesia through a 1 cm incision, requiring only one day's hospitalization and involving very little risk or discomfort. Exploratory laparotomy is a major operation usually performed under general anesthesia through a 12- to 15-cm incision, requiring ten to fourteen days' hospitalization and involving considerable risk and discomfort to the patient. Biopsy can be obtained by either method. Exploratory laparotomy has the advantage of giving a more thorough examination, including palpation as well as inspection, and also of permitting the completion of whatever operative procedure may be indicated. Peritoneoscopy, however, is a very much simpler procedure, and although it has limitations there are many cases in which it is definitely preferable.

The following cases are typical of those in which we have found peritoneoscopy a valuable diagnostic procedure.

Case 1 P. D. (M. G. H. No. 352746), a 55-year-old widowed American housekeeper, entered the hospital on April 12, 1936, with a chief complaint of pain in the right side. For 5½ weeks she had experienced dull right upper quadrant and epigastric pain, associated with gaseous eructations and intermittent attacks of nausea and vomiting. There was a history of cholecystectomy 10 years previously and pernicious anemia of 6 years' duration, treated with liver with indifferent success. On physical examination the patient appeared weak and was sallow. Abdominal palpation showed a firm, smooth, tender mass filling the epigastrium. The liver edge was smooth, firm and tender, 4 fingerbreadths below the costal margin. The patient was considered a poor risk for anesthesia. X-ray examination had been performed at the onset of the present illness at a local hospital, and was said to have shown a neoplasm of the stomach.

Peritoneoscopy showed large, elevated nodules in both lobes of the liver (Fig. 1), having the gross appearance

of carcinoma. A biopsy was obtained from one of these nodules, which on pathological examination showed metastatic carcinoma.

Comment. This patient, weakened by pernicious anemia and probable cancer of the stomach, was in no condition to withstand an exploratory laparotomy, which carries a very high mortality in such a combination of circumstances. By the relatively simple operation of peritoneoscopy the liver was found studded with nodules, a positive biopsy of



Figure 1 Case 1 Carcinomatous nodule of liver as seen through the peritoneoscope. A positive peritoneoscopic biopsy was obtained from this nodule.

metastatic carcinoma was obtained and the patient was saved a surgical exploration.

Case 2 G. D. M. (U. No. 5311), a 55-year-old Italian laborer, entered the hospital on October 31, 1936, with a chief complaint of epigastric distress. He gave a history of epigastric distress with nausea and belching for the last 2½ years, relieved by food and soda until 6 months previously, when the distress appeared with food and was not relieved by soda. There was no vomiting, but there had been a loss of 40 lb in the past 8 months. Physical examination was essentially negative except for a 2 by 3 cm. mass in the epigastrium. X-ray examination showed an annular filling defect of the antrum of the stomach, consistent with carcinoma.

Peritoneoscopy showed the liver and peritoneum throughout to be free of metastatic cancer (Fig. 2). Operation was therefore undertaken the next day, the peritoneoscopic observations were confirmed, and the gastric lesion was resected. Pathological examination showed it to be carcinoma of the stomach with metastases to regional lymph nodes. The patient made a good recovery, went home, gained weight and strength for several months but eventually failed and died of recurrence about 5 months after the operation.

Liver Disease

Metastatic malignancy
Cirrhosis
Syphilis
Congestion
Echinococcus cyst

Ascites

Cancer
Cirrhosis
Tuberculous peritonitis

Neoplasms of Stomach and Colon**Female Pelvic Disease**

Uterine tumors
Ovarian tumors
Ectopic pregnancy

In this hospital we have been using the Ruddock peritoneoscope for two years, and have made 48 examinations. There has been 1 fatality, in which the pneumoperitoneum may well be considered as a contributory cause of death. The patient was in the terminal stages of multiple lung abscess, coronary disease and possible echinococcus cyst of the liver. An error in judgment was made in subjecting him to the stress and strain of sedative drugs and peritoneoscopy. There have been no other complications except a subcutaneous emphysema in a few cases. No real errors in diagnosis have occurred, though in 1 case in which the liver appeared normal on the surface it was found by palpation at laparotomy to be full of nodules. This possibility, however, had been mentioned in the peritoneoscopic report, for the examiner had been suspicious of a smooth swelling on the surface of the liver.

Instrument We have found the Ruddock peritoneoscope satisfactory, and have used it in all except the first few examinations, when we used a thoracoscope. Ruddock has described the instrument in detail, with illustrations. It consists essentially of a very small, blunt trocar for obtaining pneumoperitoneum, and a sheath into which may be inserted a large, blunt obturator, an observation telescope or a biopsy forceps. The telescope and biopsy forceps each fit the sheath when the obturator is removed. The biopsy forceps is equipped with a small telescope so that biopsies can be taken under direct vision. A diathermy connection permits the coagulation of bleeding points. Air may be introduced at any time through the sheath.

Technic The patient is prepared as for laparotomy, including abdominal shave and scrub, fasting stomach, empty bladder and preliminary sedation with barbiturates and morphine. The instrument is sterilized in the formalin cabinet. The surgeon and his assistant observe the same aseptic precautions as for any abdominal operation. The

usual site of puncture is in the midline just below the umbilicus, but other sites may be advisable when lower abdominal adhesions or tumors are suspected. Novocain is injected into the area selected, the skin and subcutaneous tissues being infiltrated down to the peritoneum. A small stab incision is then made through the skin and fascia, and the small blunt trocar is introduced into the peritoneal cavity, care being taken not to direct it toward the vertebrae because of the danger of compressing and injuring the viscera. The peritoneal cavity is then inflated with air with an ordinary hand bulb. Failure to introduce the trocar deeply enough may result in accidental inflation of the subcutaneous tissues with air. Such an emphysema, while not to be desired, has never caused any trouble in our experience. Having obtained a good air space it is safe to introduce the large trocar into the peritoneal cavity. The obturator is then removed from the sheath and the telescope is inserted in its place. The secret of success in peritoneoscopy lies in having a large peritoneal air space so as to assure satisfactory visualization. The examination of the abdomen and pelvis should be carried out systematically. The Trendelenburg position and other changes of position may be very helpful in exposing the various organs to be examined. Rectal or vaginal palpation by an assistant may aid in exposure. Another assistant should be present to watch the patient's pulse, respiration, blood pressure and general condition.

Dangers When patients are carefully selected, peritoneoscopy is attended with very little risk. Those with serious pulmonary or cardiac disease are not good prospects. Abdominal adhesions may complicate the procedure, but by careful selection of the site of puncture difficulties have thus far been avoided. Ruddock, however, reports 8 punctures of the bowel in 500 cases. In each of these the instrument was left in place and an abdominal incision was made, which revealed that the trocar could have been removed without soiling the peritoneal cavity, for in every case the bowel was firmly adherent to the parietal peritoneum. Ruddock also records 1 death from hemorrhage following biopsy of a carcinomatous nodule in the liver. He believes that this could have been avoided by more thorough coagulation of the biopsy wound.

Indications Peritoneoscopy may be indicated in any abdominal or pelvic condition where the diagnosis is obscure, or where additional evidence is needed to confirm a diagnosis or to plan treatment. The procedure will frequently give information that will decide for or against laparotomy. We have found peritoneoscopy useful in cancer, cirrhosis, tuberculous peritonitis, ascites, pelvic tu

mors, ectopic pregnancy and ovarian dysfunction. In one case an excellent view was obtained of a polycystic liver, in another case of supposed echinococcus cyst, the liver was found to be normal, and in a third case where there was a questionable palpable mass, the peritoneal cavity was found to be normal.

Contraindications. Serious cardiac or pulmonary disease may be a contraindication, for the peritoneal distention necessary for a satisfactory examination may somewhat embarrass the circulation and the diaphragmatic movements. Numerous abdominal adhesions may constitute a contraindication, though it is usually possible to select a site for puncture at a safe distance from previous laparotomy scars. Because of the danger of spreading infection, peritoneoscopy is contraindicated in inflammatory conditions.

Relative Advantages of Peritoneoscopy and Exploratory Laparotomy. Peritoneoscopy is a minor procedure performed under local anesthesia through a 1 cm incision, requiring only one day's hospitalization and involving very little risk or discomfort. Exploratory laparotomy is a major operation usually performed under general anesthesia through a 12- to 15-cm incision, requiring ten to fourteen days' hospitalization and involving considerable risk and discomfort to the patient. Biopsy can be obtained by either method. Exploratory laparotomy has the advantage of giving a more thorough examination, including palpation as well as inspection, and also of permitting the completion of whatever operative procedure may be indicated. Peritoneoscopy, however, is a very much simpler procedure, and although it has limitations there are many cases in which it is definitely preferable.

The following cases are typical of those in which we have found peritoneoscopy a valuable diagnostic procedure.

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Peritoneoscopy showed the liver and peritoneum throughout to be free of metastatic cancer (Fig. 2). Operation was therefore undertaken the next day, the peritoneoscopic observations were confirmed and the gastric lesion was resected. Pathological examination showed it to be carcinoma of the stomach with metastases to regional lymph nodes. The patient made a good recovery, went home, gained weight and strength for several months but eventually failed and died of recurrence about 8 months after the operation.

Comment Because of the long history, the large amount of weight loss and the palpable mass, it was believed on clinical examination that the lesion was very likely inoperable. Peritoneoscopy, however, showed a normal liver and peritoneum. Operation was therefore undertaken and the growth removed. Although this patient died of recurrence



Figure 2 Case 2 Appearance of normal liver and gall bladder

eight months later, he was given a considerable period of comparative symptomatic relief.

Case 3 A. G. C. (U No 92031), a 54-year-old Italian housewife, entered the hospital on November 27, 1937, because of swelling of the legs. Twenty-seven years previously, edema of the legs appeared during the first pregnancy, disappearing after delivery but recurring with each of five subsequent pregnancies. The edema had been persistent for the past 5 years. Five years previously the patient had experienced an attack of jaundice, fever, epigastric distress and vomiting. Similar attacks had recurred on four or five occasions. The past history was noncontributory except for daily intake of beer. On physical examination the patient was moderately obese, with slightly pale mucous membranes and a muddy complexion. The heart and lungs were negative. On abdominal palpation there was mild epigastric tenderness. The liver edge was smooth and non-tender, and descended 4 fingerbreadths below the costal margin on inspiration. The spleen was palpable and of firm consistence, and was felt 2 or 3 fingerbreadths below the costal margin. The extremities showed pitting edema of both lower legs, the right leg being larger than the left. The urine was negative. The red-cell count was 1,780,000, with a hemoglobin of 45 per cent. The white-cell count was 2300, with polymorphonuclears 56 per cent, lymphocytes 42 per cent and large mononuclears 2 per cent. The red cells were larger than normal, and showed some stippling. The reticulocyte count was 58 and 86 per cent on two occa-

sions. Sternal puncture showed active red-cell formation. The fragility was normal. The liver function test was 12 per cent retention in 30 minutes. X-ray examination showed a large spleen and a small liver consistent with cirrhosis. On Graham test a few small calcified stones were seen in the gall bladder, which filled normally with the dye.

Administration of liver extract was started, but there was no response. Three transfusions were given, with improvement. Because of the failure of liver extract to raise the red-cell count, and because of constant reticulocytosis without any therapy, the anemia was considered to be at least partially hemolytic, and splenectomy was



Figure 3 Case 3 Typical appearance of small, cirrhotic, hobnail liver

believed indicated. Many of the staff, however, were not enthusiastic about splenectomy and considered the patient a poor risk. Peritoneoscopy was therefore suggested.

Peritoneoscopy showed the liver to be extremely small and granular, in fact almost nodular and hobnailed (Fig 3). All observers agreed that it was typically cirrhotic.

Comment Peritoneoscopy in this case established a positive diagnosis of advanced cirrhosis of the liver, which contraindicated the proposed splenectomy.

Case 4 A. R. K. (U No 45885), an 89-year-old Canadian widow, entered the hospital on December 31, 1937, because of right lower-quadrant pain. Nineteen days before entry she began to have a dull ache in the right lower quadrant and over the symphysis, especially when lying on her back or turning over in bed. There had also been frequency, urgency, polyuria and nocturia. There was moderate anorexia, gaseous distention and constipation. Physical examination showed a mass in the lower abdomen, chiefly on the right side, and difficult to outline. Over this region there was well localized tenderness and spasm. The temperature was 98.6 F, the white cell count was 8400.

Appendiceal abscess and neoplasm of the ovary, uterus or bowel were both considered in the differential diagnosis. As the tenderness subsided and the temperature



Figure 4 Case 4 Large, benign-appearing ovarian cyst in a patient eighty-nine years of age

remained normal, the diagnosis of abscess was abandoned and the process was presumed to be noninflammatory. Peritoneoscopy was advised.

On peritoneoscopy (January 5, 1938) there was seen a bluish-gray mass consistent with a large, benign ovarian



Figure 5 Case 4 Aspirating trocar plunged into an avascular area in the cyst under direct peritoneoscopic vision

cyst occupying the entire right lower quadrant and extending slightly to the left of the midline and above the umbilicus (Fig 4). It was very smooth in outline, apparently nonadherent and definitely translucent.

A probable diagnosis of benign ovarian cyst having been established, the possible choices of therapy were considered. With no treatment at all this woman would have been left with a cyst which was apparently giving definite symptoms. Laparotomy through a long incision, with removal of the large unruptured cyst, was considered hazardous and unjustifiable in a woman of this age. Laparotomy through a small incision, with puncture of the cyst and removal of the cyst wall, was also rejected as somewhat hazardous and unsatisfactory. Blind tapping of the cyst through the abdominal wall was considered dangerous, as the trocar might enter the bowel or puncture a blood vessel. Aspiration of the cyst under direct peritoneoscopic vision was felt to be the ideal procedure.



Figure 6 Case 4 Resultant collapse of the cyst

Accordingly, peritoneoscopy was again performed (January 7, 1938). The peritoneoscope was introduced through the incision previously used (in the midline just above the umbilicus), and a long trocar was inserted through the abdominal wall in the right lower quadrant. Under direct vision through the peritoneoscope this was seen to enter the abdominal cavity near the cyst. An avascular area in the cyst wall was then selected and the trocar was plunged deeply into the cyst (Fig 5), suction was applied, and 520 cc. of clear, thin, straw-colored fluid was aspirated, with resultant collapse of most of the cyst (Fig 6). The temperature remained absolutely flat following both peritoneoscopies. Because of the patient's age she was kept in the hospital a little longer than usual, but was discharged home improved 5 days after peritoneoscopy.

Comment While we do not recommend this form of therapy for ovarian cysts, it so happened that it was admirably suited to meet the problem presented by this patient in her ninetieth year.

Case 5 M E B (M G H No 355031), a 69 year-old, single American woman, entered the hospital on July 23, 1936, because of vomiting and a 30-lb weight loss of 3 months duration. Two months previous to admission she noticed a large, painless lump in the right abdomen. On physical examination the abdomen was markedly distended and rather tense, with fluctuation of the lower portion. A firm, rather irregular, moderately tender mass was palpated in the lower abdomen. Rectal examination showed several fixed, irregular nodules behind the cervix.

At peritoneoscopy, after removal of 250 cc. of straw-colored fluid, the entire lower abdomen was seen to be occupied by a large, smooth, pearl gray mass, from which a biopsy was obtained. The anterior peritoneum appeared to contain metastatic nodules. The pathological report was metastatic carcinoma. A series of x-ray treatments was given.

Comment In this case, peritoneoscopy established a positive diagnosis of carcinoma, probably of ovarian origin, and enabled the x-ray department to carry out an intelligent plan of x-ray therapy.

Case 6 G H. (U No 88618), a 23-year-old single, American-born truck driver of Syrian extraction, entered the hospital on October 29, 1937, complaining of progres-



Figure 7 Case 6 Tuberculous peritonitis with multiple adhesions peritoneum studded with tubercles

sive swelling of the abdomen of 3 months duration, with a 15-lb weight loss. Physical examination showed marked scoliosis, a full, rounded abdomen, suggesting fluid but without much positive physical evidence, and a slight splenomegaly. X-ray examination demonstrated scoliosis, with tuberculosis of the right upper lobe (clinically inactive).

On peritoneoscopy the abdominal cavity was found to be completely filled with numerous filmy adhesions, on some of which were many pin point tubercles (Fig 7). Only a small amount of fluid (100 cc.) could be removed.

Comment In this case the differential diagnosis was between neoplasm with ascites, Banti's disease and tuberculous peritonitis. From the point of view of treatment, a positive diagnosis was important. Peritoneoscopy established the diagnosis of tuberculous peritonitis.

Case 7 C McC (U No 92925), a 29 year-old, white, American housewife, entered the hospital on November 18, 1937, because of vaginal bleeding. Eighteen days before entry the patient missed her normal menstrual period, experienced morning vomiting for a few days and noted swollen, tender breasts. On three occasions during the



Figure 8 Peritoneoscopic view of a normal uterus, part of the left tube and part of a somewhat enlarged left ovary

past 8 days she had suffered bilateral lower abdominal cramps, with moderate vaginal bleeding. She had been married 9 years, but had had no pregnancies. On physical examination the abdomen showed diffuse tenderness in the left lower quadrant. Vaginal examination disclosed a soft cervix, dilated external os, slightly enlarged, soft fundus, and a tender, movable, walnut sized mass in the left vault. There were possible lesions in the right vault. The Aschheim Zondek test was positive.

Peritoneoscopy (November 19, 1937) showed free blood in both anterior and posterior cul-de-sacs. The fundus of the uterus appeared normal in size and color. The distal end of the right tube was distended so that it appeared to be about 6 cm in diameter. The proximal end of the left tube appeared normal, but the distal end was not recognized. On the basis of the hemoperitoneum and the mass in the right tube, a diagnosis of ectopic pregnancy with right hematosalpinx was made. Operation confirmed the peritoneoscopic findings of hemoperitoneum and a cystic mass in the right tube. The ectopic pregnancy, however, was in the distal end of the left tube.

Comment The clinical diagnosis in this case was a question of ectopic pregnancy. The demon-

stration of hemoperitoneum by peritoneoscopy made the diagnosis of ectopic pregnancy a positive one.

Case 8 R. T. (U No 92127), a 32-year-old, single, American woman, entered the hospital on November 22, 1937, because of amenorrhea. Although the catamenia were normal and regular every 28 days from the time the patient was 11 years old until she was 19, her periods suddenly stopped at that time, and except for one normal period at the age of 20 she had not flowed again. Except for nervousness, occasional hot flashes and mental depression, the patient had been in good health. Physical examination showed normal secondary sex characteristics. Pelvic examination revealed a marital introitus, a small nulliparous cervix and the fundus probably in second-degree retroversion.

On peritoneoscopy the uterus was clearly seen to be in normal position and of about two-thirds normal size. Both ovaries were small and atrophic, with no evidence of recent scarring or of follicle or corpus-luteum formation.

Comment In this case, peritoneoscopy disclosed a small uterus with atrophic ovaries. The positive information thus obtained was inductive to intelligent therapy by the Ovarian Dysfunction Clinic.

CONCLUSIONS

Peritoneoscopy is the direct inspection of the abdominal and pelvic cavities by an endoscopic instrument. A satisfactory biopsy can be obtained.

In properly selected cases it is safely and easily performed under local anesthesia, with little discomfort to the patient.

Peritoneoscopy will not replace exploratory laparotomy in all cases, but in certain cases it makes it possible to avoid major surgical operations. Whereas surgical exploration usually involves general anesthesia, long incision, two weeks' hospitalization and considerable risk, peritoneoscopy re-

quires only local anesthesia, a stab incision, one day's hospitalization and very little risk.

Peritoneoscopy may be indicated in any abdominal or pelvic condition where the diagnosis is obscure or where additional evidence is needed to confirm a diagnosis or to plan treatment. It is contraindicated when there is serious cardiac or pulmonary disease, and when there are inflammatory processes or many adhesions in the peritoneal cavity. We have found the procedure of value in abdominal cancer, cirrhosis, tuberculous peritonitis, ascites, pelvic tumors, ectopic pregnancy and ovarian dysfunction.

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PAPERS FROM THE FAULKNER HOSPITAL

THE CONDITION OF THE CERVIX AS DETERMINED BY VAGINAL EXAMINATION

A True Index of the End of Pregnancy

RAYMOND S. TITUS, M.D.*

MEDICAL teaching twenty-five years ago was opposed to vaginal examinations late in pregnancy, and the teaching today has changed very little in this regard. Inherited fear of infection by vaginal examination is, of course, the reason for this attitude, and it must be acknowledged that many cases of puerperal sepsis have been avoided by strict adherence to this dictum. However, so long as the patient is neither bleeding nor in labor, in other words presents no raw surface through which infection may enter, the chances of infection are negligible and are far outweighed by the information which is gained by means of the procedure. Only by its use can the changes in the cervix that immediately precede the onset of labor be appreciated, and since these changes are essential to the proper management, particularly in the induction of labor, in many cases of pregnancy, their recognition is extremely important.

The acquisition of the information contained in this communication has been slow in accumulation. For twenty-odd years observations have been made. The extremely rapid termination of pregnancy in one case after therapeutic induction of labor in contrast to the delay in another was puzzling. Both patients might be at the same time of their pregnancies according to dates, and yet one labor might be extremely easy, absolutely normal and uncomplicated, while another might be delayed for two or three days. The quest of ascertaining why these differences existed led to vaginal examinations, and has resulted in the information later on described.

In this communication something is said of elective induction of labor. This paper is no brief for this procedure. Such cases are referred to only because of the information they furnish in regard to the changes in the cervix. Elective induction of labor is a major obstetrical performance and should be performed only by the well-trained and experienced obstetrician, but it must be appreciated that the acquisition of the knowledge upon which proper criteria for elective induction are based has also furnished the data for the recognition of the changes that occur in the cervix during the last month of pregnancy.

In the past twenty-five years there have been

several very important advances in clinical obstetrics. Rectal examinations during labor are so much of an advance that they should be universally adopted, and it is surprising that they are not. They certainly should take the place of almost all vaginal examinations. Routine episiotomy is a procedure the benefits of which entitle it to be classed as a true step in advance. Fundal pressure has done away with many forceps operations. Analgesia has reached a state where in trained hands it is almost perfect. But no advance has been so important, has so lowered the fetal and maternal mortality and maternal morbidity, as an appreciation of the dangers of delivery through the physiologically unprepared cervix.

Twenty-five years ago the cervix during labor received little or no consideration. In cases in which immediate delivery seemed necessary, delivery was accomplished by the vaginal route, irrespective of the condition of the cervix. The results too often included badly mutilated cervixes, postpartum hemorrhages, ruptured uteri and high fetal and maternal death rates. During this era patients with placenta previa, severe toxemia or eclampsia were routinely delivered through the undilated cervix, and many maternal deaths were attributed to these complications which were due solely and entirely to the operative procedure.

But has our knowledge about the normal cervix in the last weeks of pregnancy increased beyond what we knew twenty-five years ago? Much more is known, but this is not generally appreciated. The teaching of obstetrics has not stimulated the acquisition of a knowledge of the cervix, because it has long been an axiom that the vagina should be left alone in the latter months of pregnancy, that vaginal examinations should be done only when some indication made it necessary—not as a routine procedure. Undoubtedly, inherited fear of infection has entered into this teaching. This fear is probably groundless, for, in view of human nature and human weakness, it is reasonable to infer that the vagina is invaded quite often through intercourse in the last few weeks of pregnancy, and it seems unreasonable to believe that the invasion of the vagina, with a sterile glove, of a person not in labor will cause infection.

If we are to learn of the cervix late in pregnancy, the cervix must be felt. In no other way can one know its normal changes. We learn by

touch If we do not examine patients routinely and frequently in the last few weeks of pregnancy, we cannot appreciate what normal changes take place. Whether we believe in elective induction or not, it has, by necessitating frequent vaginal examinations in an attempt to determine when the time for induction is ripe, been responsible for our knowledge of the normal, physiologic changes of the cervix late in pregnancy

For one reason or another, inductions were formerly done on certain cases by rupturing the membranes, because the results in other cases that had had to be induced had been so successful. At that time dates alone were the criteria as to when this should be done. Experience showed that dates were not a constant, safe indication. Some of these patients had their babies quickly. Others would not start in labor for thirty-six or forty-eight hours, and although they all came along successfully, some of them undoubtedly had harder and longer labors than were necessary. Each of the rapid cases stimulated further investigation and brought up the question why some were delayed. To ascertain these reasons routine vaginal examinations at weekly intervals after the eighth month were instituted. One must appreciate that hundreds of such examinations were done, and it was not until a great many had been made that it became clear that as these patients approached the end of their pregnancies the cervixes became obliterated, soft, and patulous in varying degrees, and the internal osar became soft. When these conditions were present, it was realized that the patient was ready to be induced, and these are the criteria upon which an intelligent induction is based. There are no other criteria! The corollary is that the unobliterated, unopened cervix almost invariably means that the end of pregnancy has not yet been reached.

The patient who is within a week or so of her expected date, who starts up spontaneously and who has a baby normally within two or three hours is really ready to have her baby, and the same is true of the patient whose baby arrives anywhere from one-half to four hours after the induction of labor. But when one realizes that the latter was induced because the cervix was soft, obliterated and dilated, one must admit that the cervix was an index of the end of the pregnancy. May it not be said, irrespective of dates, that that particular person was at the end of her journey? And then when it is pointed out that occasional patients have been examined for one reason or another as early as three weeks before the expected time of labor whose cervixes were found to be flat, soft and patulous, who began labor within a few days, whose babies arrived within

one and a half hours of the onset of labor, whose babies weighed as much as or more than the previous babies of these same patients, will it not then be admitted that the cervixes in these cases showed that the end of pregnancy was at hand? And then when other cases are demonstrated that were examined week after week for four weeks after the expected end of pregnancy and still had firm and undilated cervixes, will it not be admitted that the cervix is a better index of the end of pregnancy than any other index we now have? And, lastly, when patients whose dates for elective induction had been definitely set because of the condition of the cervixes started up spontaneously within twenty-four hours of this settled date, will this not be a proof that one can tell by the cervix when the end of pregnancy is around the corner? These questions will be answered in the cases to be demonstrated.

Four hundred and forty-seven deliveries by the vaginal route are the basis of this paper. Of these, 138 were induced electively by the rupture of the membranes. Thirty-two more started up spontaneously after a date had been set for their inductions.

It is impossible to say how many vaginal examinations were made on these patients, but undoubtedly there were a great many. Is the vaginal examination a safe procedure? Does it cause infection? The answer is that in this series there were two cases of infection. One started five days after delivery and was due to a hemolytic streptococcus, the patient ran a fever for five days only. The second case was that of a patient who had been infected with gonorrhea during her pregnancy, was not examined in the office before labor, and was delivered normally.

As to the technic of these vaginal examinations, the patient is examined with a sterile glove, which is moistened with a 1:20 dilution of Lugol's solution to make the examination more comfortable for the patient. The vulvae should be gently cleansed with soap and water and rinsed with the dilute iodine solution.

If vaginal examinations are to be done routinely late in pregnancy, they must not only be safe but they must also be done for a purpose. What do they teach? In the first place, they teach the physician to recognize the normal changes that go on week by week in the cervix toward the end of pregnancy, and in no other way can these changes be appreciated. Secondly, they show that the majority of patients have obliterated, soft, open cervixes before they start in labor, and that it is the unusual case that starts in labor with an unobliterated firm, undilated cervix. These facts are of value both to the physician and to

the patient, particularly one living in the country. If the examination shows an unobliterated, firm, undilated cervix, it is perfectly safe for the patient to return home. When such a patient starts up spontaneously in labor we know that the cervix will require a long while to take up and dilate. This is important information. More intelligent handling of the case, if labor starts, is possible. If, on the other hand, examination shows a cervix that is entirely obliterated and open, the patient should remain in town within easy distance of her hospital. Thirdly, vaginal examinations by those who believe in elective induction will show definitely whether the individual case is ready to be induced. Fourthly, they give a very definite idea of when the time for delivery is at hand in patients whose periods are not to be relied upon. All these facts are well worth while from the obstetrician's point of view and often from the standpoint of the patient.

In reviewing these cases no definite tabulation has been attempted. However, the longest labor was ten hours, the shortest eighteen minutes, and the average duration was from three to five hours. There were no complications, there were no prolapses of the cord, there were no postpartum hemorrhages, and no babies were lost. The following cases illustrate one or more of the above points.

Case 1 (No 2509) Para III. This patient was due on dates on May 27-30. On May 4, vaginal examination showed an engaged vertex and an almost flat cervix, dilated one finger plus. One week later, the cervix was two fingers dilated, flat and soft. She was induced on May 14, when she was 2 weeks early on dates. The membranes were ruptured at 8:45 in the morning and the baby was delivered normally 1 hour and 20 minutes later. This baby weighed 7 lb, 6 oz, and a previous baby had weighed 7 lb, 12 oz.

This case proves by the duration of the labor and the size of the baby that the patient was at the end of her pregnancy even though the expected date, as ordinarily computed, was two weeks away.

Case 2 (No 2975) Para II. This patient was due on dates on November 17-20. Examination on October 21 showed the cervix to be entirely flat, one finger dilated. She lived 25 miles from Boston. Her previous baby was premature and weighed 5 lb, 12 oz. Her membranes were ruptured at 8:50 a. m. and the baby was born at 9:15 a. m. This baby weighed 6 lb, 9 oz, and in no way looked premature.

Examination of the cervix in this case showed that labor was imminent approximately four weeks before the computed time. The duration of the labor and the size of the baby bore out this inference.

Case 3 (No 2774) Para I. This patient was 41 years

old and was due on dates on October 14-17. She was seen in the office on October 1, at which time vaginal examination showed an engaged vertex and an absolutely flat cervix. Vaginal examination again a week later showed a flat cervix, dilated one finger. The patient went into the hospital that night. Her membranes were ruptured at 8:45 a. m., and a simple forceps was done to a crowning head shortly after 2:00 p. m. The baby weighed 8 lb.

Case 4 (No 2375) Para I. This patient was 40 years old and was due on dates June 10-13. Vaginal examination on May 31 showed the cervix to be entirely taken up, dilated one finger, with a tight internal os. On June 7 vaginal examination showed the cervix to be entirely flat, and the internal os dilated one finger. Membranes were ruptured about 9:00 a. m. on June 12, and the baby was delivered shortly after 1:00 p. m. The baby weighed 7 lb, 6 oz.

These two cases show that by the examination of the cervix, combined with a knowledge of the changes taking place late in pregnancy, it is possible to predict a relatively easy labor.

Case 5 (No 3037) Para III. This patient was due on dates on January 4-7. She lived out of town and was not seen during her pregnancy. Vaginal examination on December 26 showed no obliteration of the cervix, it was dilated one finger and firm. A note made at that time reads, "This patient will go three weeks." On January 2 the cervix showed no change from the previous visit. On January 9, a note reads, "Cervix still only one finger, tight, not obliterated, and if labor starts, it will be long." Three days later the patient started up spontaneously and had a very hard labor. Pains 3 or 4 minutes apart over a period of 10 hours were required to deliver normally a child weighing 8 lb, 14 oz.

An appreciation of the difficulty that a patient, going in labor with a cervix of this type may experience is of value to the obstetrician.

Case 6 (No 2959) Para I. This patient was 28 years old and was due on dates on November 8-11. Vaginal examination on October 27 showed the cervix to be posterior and not taken up. Vaginal examination on November 3 showed that the head was not in the pelvis, and the cervix not taken up. On November 9 the cervix was not flat or open, but the head could be engaged. On November 19, 8 to 11 days after the expected date, examination showed no change. On November 25 vaginal examination showed the cervix to be much shorter and smaller but not open. The patient started in labor spontaneously on November 26, early in the morning, and it was very evident that she was not ready and that labor would be long. She did poorly and labor was terminated the following afternoon, November 27, because meconium began to come away (this was after the membranes had ruptured). The baby weighed 7 lb, 10 oz.

Labor may have been complicated by suspension, but the character of this labor was definitely prognosed by vaginal examination.

Case 7 (No 2681) Para II. This patient was due on dates on April 15-18. Vaginal examination on April 3 showed the cervix to be soft, flat and two-fingers dilated. On April 6 the membranes were ruptured at 9:45 a. m., and the baby was delivered normally at 10:03 a. m. The

cervix at the time of examination was extremely soft and flat and dilated three fingers. The baby weighed 7 lb, 2 oz.

Case 8 (No. 2742.) Para III. This patient was due on dates on December 26-29. On December 15 vaginal examination showed the cervix to be soft and quite flat. On December 21 vaginal examination showed the cervix to be soft, two-fingers dilated, and easily dilatable. The following day the membranes were ruptured at 9 15 a. m. and she delivered herself in 35 minutes of a baby weighing 8 lb.

These two cases are ideal examples of the value of determining the condition of the cervix in cases of elective induction.

The next few cases are interesting from the standpoint of the determination of the end of pregnancy by the changes observed in the cervix rather than by dates.

Case 9 (No. 2061.) This patient was due on dates on May 21-24. She lived in New York and came to Boston the end of April, hoping to have her baby as soon as the baby was ready to come. Vaginal examination on May 23 showed the cervix to be soft, but not in the least bit taken up. Examination on June 1 showed the cervix to be shorter, but still not ready. On June 10 the cervix was soft but not obliterated. On June 18 the cervix was practically flat and just admitted one finger. In spite of her request that labor be started, this patient was told that she was not ready to have her baby, and she did not start in labor spontaneously until June 30, which was five weeks later than the estimated date. The baby was not unduly large, weighing only 7 lb., 10 oz., and the patient had a perfectly normal labor.

Case 10 (No. 2904.) Para I. This patient was due on dates on June 8-11. Vaginal examinations began on May 28, at which time the cervix was not taken up or flat. On June 11, 18 and 25 the cervix was still not flat. On July 2 the cervix had begun to show the changes that one expects to feel toward the end of pregnancy. It was almost

flat and dilated one finger. She started in labor spontaneously on the evening of July 8, and was delivered normally the next morning.

Case 11 (No. 2933.) Para I. This patient expected her baby September 16-19. On September 4 the cervix was not flat, soft or open. On September 14 the cervix was not flat or open. On September 21 the cervix was beginning to take up and just admitted a finger. On October 1 the cervix was almost obliterated, but not flat. On October 7 the cervix was still not entirely obliterated and was not open. On October 14 the cervix was almost flat, admitting a finger. On October 16 the patient started in labor, she had a normal labor which was terminated by forceps. The baby weighed 8 lb, 9 oz.

Case 12 (No. 3035.) This patient was a diabetic whose catamenial history was absolutely unreliable. She was always very irregular, at times going as long as 4 and 5 months without flowing. She did not know that she was pregnant until she was 4½ or 5 months along. She thought that her last period was in January, but she did not know whether she had one in December. No vaginal examinations were made until October 6, at which time it was evident that she was about ready to have her baby. The head was well in the pelvis, and the cervix was very soft and dilated one finger. Three days later the membranes were ruptured at 9 00 a. m., and she delivered herself at 3 00 p. m. of a baby weighing 6 lb, 13 oz.

* * *

In conclusion, it has been shown that the normal cervix at the end of pregnancy is an obliterated, soft, patulous organ, that an appreciation of these changes can be obtained only by routine vaginal examinations in the last few weeks of pregnancy, that the latter is a perfectly safe procedure when properly performed, that the cervix is the only index upon which induction should be based, and that the cervix is the real index of the end of pregnancy.

GOUT

Report of an Unusual Case in a Woman

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MEDICAL teaching for a generation has led to the belief that gout is a rare disease, so much so that it is often not considered in the differential diagnosis of acute and chronic arthritis. Recent literature¹⁻³ has done much to change this point of view, and to point out the criteria by which the disease may be recognized before tophi appear. The importance of correct diagnosis is self-evident in that the management and prognosis are so different from the other rheumatic

diseases with which it may be confused. Needless removal of suspected foci of infection, vaccine therapy, and so forth, may be avoided by correct recognition of the disease. To summarize the clinical aspects of gout and to record a case with rare features are the purposes of this article.

CASE REPORT

A woman of 69 was admitted to the Faulkner Hospital on September 9, 1937, she had been suffering from acute polyarticular arthritis for 5 weeks. Five years before admission, having been previously in robust health all her life, she had a sudden attack of acute pain in the big toes

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of both feet, which lasted 4 weeks and cleared up completely. Repeated careful questioning failed to reveal a history of any previous joint disturbance. Since then she had had many similar attacks in the big toe, the attacks rarely lasting more than 2 weeks until the present one. Occasionally during the past 2 years she had also had attacks involving the knees and wrists as well as the feet. Four years before admission she was told that she had gout and that the blood uric acid was elevated. Five months previously she had an attack following an emotional shock caused by the death of her sister. Five weeks previous to admission she began to have the present attack, which continued unabated and involved the toes, ankles, wrists and knees, and in addition, for the first time, the right shoulder. With this attack she had had no appetite, was constipated, but had had no nausea or vomiting. She had been able to be up and about with considerable discomfort until a few days previously, since when she had had to remain in bed. She had lost 5 lb during the previous 5 weeks.

The family history was significant in that her father had had gout. He died of pneumonia and kidney trouble at 63. Her mother died at 77, cause unknown.

The patient had rarely taken alcohol. She had always eaten sparingly of meat. She rarely ate liver, sweetbreads or kidneys, but was fond of sardines. She took one cup of coffee daily and no cocoa.

She had always been well. An appendectomy had been performed many years before. She had had migraine during her youth, but this had ceased before the menopause. Eight years before her present attack she had had a retinal hemorrhage in the left eye, which resulted in poor vision in that eye since that time. Eight months previously she had a sudden weakness in her right arm and leg and almost fell. She remained in bed 10 days, but was not paralyzed after she got up. The weakness of the right arm and leg had been very slight, and the degree of hemiplegia was not sufficient to cause any pain in the shoulder.

Physical examination revealed a well-developed woman weighing about 150 lb, lying in bed in considerable discomfort. She was unable to move her legs, wrists or right arm easily, but was able to sit up without pain if assisted. The temperature was 102°F, the pulse 80 and the respirations 20. There were no other abnormal findings except as follows. The blood pressure on admission was 190/104, but after she had been in bed for 2 days it fell to 150/90. The liver was just palpable but not tender. The right knee jerk was consistently a little more active than the left, but the Babinski sign was not present. Examination of the extremities showed marked limitation of motion from pain in the knees, ankles and wrists and the right shoulder. There was moderate swelling of the wrists, especially the right, but no fluid was demonstrated in the knee joints and no swelling or redness of the shoulder was noted. There was redness, swelling and dilatation of the veins around both metatarsophalangeal joints, and a small tender lump at this site on the right. There were no tophi in the ears and no swellings over the olecranon processes.

Urinalyses were negative, except that the specific gravity did not go above 1.014 both in routine examinations and in a concentration test. The red-cell count was 4,700,000, with a hemoglobin of 94 per cent (Sahl). The white-cell count on admission was 8000, with 84 per cent polymorphonuclears and 16 per cent lymphocytes. A blood Hinton test was negative. The uric acid was 50 mg per cent (whole blood) on September 9, 130 (serum blood taken under oil) on September 11, and 8.25 (serum) on

September 15.* The nonprotein nitrogen was 50 mg per cent on September 9 and 44 on September 15. The blood sugar was 108 mg per cent on September 15. The sedimentation rate was 125 mm. per minute on September 30 (normal, 0.08 to 0.35 mm per minute, Rourke-Ernstene method).

The bromsulphalein and galactose tolerance tests for liver function were both within normal limits. An intra-venous phenolsulfonphthalein test done on September 12 revealed dye excretion of only 13 per cent at the end of 15 minutes, with a total of 68 per cent in 2 hours.†

X-ray photographs of the involved joints showed mild hypertrophic changes around the joints, and punched-out areas in the first left metatarsal bone and the first cuneiform bone, of a type characteristic of gout (Fig 1).

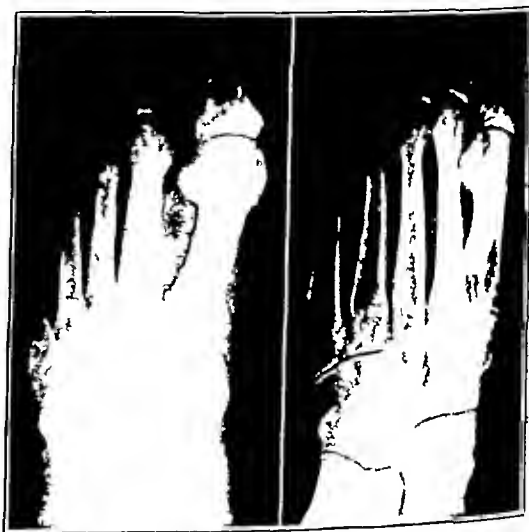


Figure 1 X-ray photographs of the left foot, taken August 16 by Dr Charles A Whelan. Note punched-out areas in the head of the first metatarsal and the first cuneiform bone.

The patient was extremely uncomfortable on admission, but was markedly relieved of all her acute pain after administration of colchicine (1/120 gr every 2 hours for four doses on 2 successive days). This amount of the drug produced diarrhea.

The temperature fell to normal on the 3rd hospital day. She was seen in consultation by Dr Charles L. Short, who agreed with the diagnosis of gout. She was discharged September 17, 9 days after admission. At this time the skin around the right great toe began to desquamate. She continued having stiffness and a certain amount of aching off and on for 2 weeks after discharge. The right shoulder remained stiff and painful longer than the other joints. On October 18 she was again given colchicine to the point of diarrhea because of exacerbation of pain in the shoulder, and this relieved the pain promptly and completely. After discharge her appetite and sense of well-being gradually improved, the joint stiffness improved, and she was able to walk almost normally 1 month after admission to the hospital and 8 weeks after the onset of symptoms. Treatment, except for colchicine for the acute attack, consisted of massage and mild physiotherapy.

*The upper limit of normal for uric acid in whole blood is 4.5 and in serum 6.0 mg per cent (Folin 1933 method).

†The lower limit of normal excretion of the dye at the end of 15 minutes in this test is 25 per cent.

after the acute symptoms had subsided, gradual resumption of activity, and a low-purine, high-carbohydrate and low-fat diet with a large fluid intake. She was given 20 gr of aspirin daily for 10 days after discharge, more than that amount having produced tinnitus. On November 17 she was seen at the office and reported having occasional joint ache of mild degree. She was given Tolysin (neocinchophen) at this time, to be taken in 0.5-gm. doses three times a day twice a week for 4 weeks, and reported by telephone on December 22 that she had been very much better when taking this drug. It was not continued after that date. On February 2, 1938, she reported never having felt better in years. She had gained 8 lb.

The diagnosis of gout in this patient, correctly made soon after the onset, is undoubted, since the clinical features were characteristic, namely, she had recurring attacks of acute arthritis with complete remission between attacks, the attacks tending to last longer as time went on, the metatarsophalangeal joint of the great toe was frequently involved, she had an elevated blood uric acid, the x-ray showed a punched-out area characteristic of gout in one metatarsal bone, colchicine gave almost complete and prompt relief of symptoms. Credit should be given to the physician who correctly diagnosed this case soon after the onset four years before, inasmuch as the average duration of time between the first attack and the correct diagnosis was fifteen years in a series of 100 cases studied by Hench.¹

There are three features about this case which are very unusual. First, the patient is a woman. Gout is a disease of men, so much so that it is difficult to defend such a diagnosis in a woman. Most statistics give an incidence of about 98 per cent in men. Secondly, the patient's first attack did not occur until the age of sixty-four. In a series of 116 cases studied by Williamson⁵ only 1 case had the first attack after the age of sixty, the large majority starting between thirty and fifty, an age of incidence which agrees with other reported figures. Thirdly, the shoulder joint was involved. It is very rare for gout to involve the joints of the torso, hips or shoulders, and some clinicians of large experience in gout have never seen involvement of these joints.⁶

In addition, as frequently accompanies gout, she had evidence of kidney disease with delayed phenolsulfonphthalein excretion, slightly elevated blood nonprotein nitrogen and inability to concentrate urine normally, and of arteriosclerosis with a mild hemiplegia.

ETIOLOGY

Little is known of the etiology of gout except that there is a disturbance of uric-acid metabolism. The hyperuricemia and urate deposits, however, are not the cause but simply an index of gout, and

injection of uric acid in a gouty subject will not provoke an attack. The disease is undoubtedly chronic, and the attacks are merely "acute explosions." Although considerable chemical and metabolic information regarding gout has been assembled,⁷ there is actually little more real understanding of the pathologic physiology of the disease than there was fifty years ago.

INCIDENCE

As pointed out above, the usual medical impression regarding gout is that it is a disappearing disease rarely seen nowadays. Because of this attitude, according to Hench,² only 1 out of 4 or 5 cases is correctly diagnosed in its early stages in the absence of tophi and chronic hyperuricemia. On the other hand, the diagnosis may be made too freely so that only 1 of 2 or 3 patients so diagnosed actually has the disease, since many chronic arthritides with transiently elevated blood uric acid, but without the characteristic clinical features of gout, are included. These two attitudes reflect either a lack in general knowledge of the clinical features of gout, or—more important, perhaps—the belief of most physicians that gout is so rare that it should not be seriously considered in the differential diagnosis of arthritis. That gout is not rare is attested by many reports on the disease, and at the Mayo Clinic 5 per cent of the cases seen by arthritic consultants are cases of gout.⁸ The author has seen 1 other case in private practice within six months. Without doubt the incidence of gout will increase with increasing consciousness of its clinical aspects.

CLINICAL FEATURES

Gout is a disease of men, and as a rule begins after thirty-five. A hereditary aspect is undoubtedly a prominent feature of the disease, although not in the cases reported in this country, probably because it has not been looked for carefully enough. It occurs in 60 per cent of the cases reported in England.^{9*} Gout always begins with acute attacks of arthritis, lasting at first only a few days, and occurring perhaps once a year, later coming more often. As the disease progresses the attacks last longer and occur more frequently, and after many years chronic gouty arthritis may develop with little freedom from joint symptoms at any time. The highly distinctive feature of the disease, however, is the *complete* freedom of symptoms between attacks in the early stages. Thus, one reads of a man who once won an Olympic race between attacks of gout.¹¹ The attacks are very sudden and

* Jacobson¹⁰ obtained high serum uric acid levels in 3 non-gouty relatives of 3 gouty patients suggesting an inherited metabolic defect.

acute, although they may be preceded for a few days by gastrointestinal symptoms, as anorexia or indigestion, or by irritability and dizziness. They are said to begin chiefly between 2 and 7 a. m. and they reach their maximum intensity within twenty-four to thirty-six hours. The great toe is involved in not more than 60 per cent of the cases, this is in contrast to an impression that podagra is universally present.² In the other 40 per cent, one or more of the other small joints of the extremities may be involved, the hips, spine and shoulders rarely being involved.

During the attack the joint involved becomes acutely inflamed, bluish red and tense, with dilatation of the vessels around it. The skin is apt to be shiny, with edema and later desquamation and itching. Tenderness of the great toe, so often the site of involvement, is on the mesial aspect of the metatarsophalangeal joint.

As the disease progresses urates are deposited near or in the small joints of the hands and feet, both olecranon bursae and the ear lobes. A gouty abscess occasionally develops near a joint, and if this abscess is incised, a persistent sinus may develop. The x-ray at this stage is apt to show punched-out areas in the subchondral bone, especially the heads of the metatarsals. The x-ray may not, however, be of much assistance in diagnosis inasmuch as changes do not occur until late in the disease. The blood uric acid is not invariably elevated during all stages of gout, according to Hench.² At first the elevation may be transient during an attack (or even absent), with normal levels between attacks. Later the elevation is more persistent, and in chronic gouty arthritis permanent. Jacobson's comprehensive data, on the other hand, indicate that only rarely is a normal serum uric-acid level obtained during any stage when the test is carried out under proper conditions (blood taken under oil).¹⁰

During an acute attack the patient may have moderate fever. The blood examination is not characteristic. The sedimentation rate may be elevated, as in the case reported here. Chronic vascular nephritis is very common in association with gout, as well as renal stones, presumably on account of the difficulty the kidney has in excreting uric acid. This association is so common that any patient with arthritis and renal disease should be suspected of having gout.

Attacks of gout are very likely to be precipitated by various episodes, which may seem so unimportant that the patient is unaware of them, such as trauma, — which may be trivial, — a mild infection, worry or dietary indiscretion. In a gouty patient an operation is very apt to provoke an attack, and acute

arthritis occurring a short time after an operation is nearly always gouty arthritis.² A fishing trip, a long automobile ride or anything which causes an upset in the ordinary routine of life may cause an attack. Treatment for some other disease, such as insulin or Salyrgan, a ketogenic diet, liver therapy, and so forth, may each precipitate attacks of gouty arthritis.

DIFFERENTIAL DIAGNOSIS

Gonorrheal arthritis, rheumatic fever, trauma, acute bursitis, hemophilia, acute rheumatoid arthritis and septic joint are the main conditions in which acute arthritis occurs. The clinical features of all are so different from gout that no difficulty should be experienced in differentiating them, provided gout occupies a prominent place in the mind when one is thinking what a case of acute arthritis may be. If gout is not seen until the stage of chronic gouty arthritis has been reached, the differential diagnosis will lie between rheumatoid and hypertrophic arthritis. The history of onset is the most important differential feature, hypertrophic arthritis being always, and rheumatoid arthritis usually, insidious in onset, whereas chronic gouty arthritis is invariably preceded by acute attacks with complete remission.

TREATMENT

It is not within the scope of this paper to discuss treatment in detail. Furthermore, when one evaluates the discussions in the literature on the therapy of gout, one comes to the conclusion that little of value has been contributed since colchicum was introduced by von Stoerck in 1763. (Actually a plant remedy, hermodactyl, was used in 500 A.D. with great success, this was later discovered to be the same plant as colchicum.¹¹) Theoretically, a purine-free diet should be adhered to, but doubt exists whether such a diet has any effect in reducing attacks.³ Because Lockie and Hubbard¹² were able to provoke attacks with high fat diets, it is doubtless wise to limit fats. It is of interest that, during the War, gout practically disappeared in Germany, owing probably to the small amount of meat available and to widespread malnutrition.¹³ The theoretically ideal gout diet is a purine free, low-fat, high-carbohydrate, liberal protein one. In practice it is probably best to insist on a reasonably simple low-calorie diet, prohibiting high purine foods, with especial emphasis on regularity of meals and routine of life, without excesses of any kind and with a large fluid intake. Dehydration from exercise should be carefully avoided.

Cinchophen, which causes increased excretion of uric acid, produces such serious liver damage in

the rare patient who is sensitive to the drug that many authorities advocate its complete abandonment in the therapy of gout, especially as salicylates are reported to be just as effective in promoting uric-acid excretion.⁸ Other workers, such as Hench,⁹ feel that cinchophen is so valuable in preventing attacks and the sensitive patient so rare that it should be used. If it is to be employed, neocinchophen, which is less toxic, is preferable. A dose of 0.5 gm three times a day two or three times a week for a month, alternating with periods of freedom from the drug, may be effective in preventing attacks.

Colchicine, the action of which is unknown, acts as a specific in the treatment of the acute attack, and is by far the most valuable drug in the management of gout. It should be used in frequent doses, such as 1/120 gr every one or two hours until nausea, vomiting or diarrhea occurs. It is usually not effective unless enough is given to produce gastrointestinal symptoms. When the amount sufficient to produce diarrhea has been determined for the individual patient, somewhat less than this amount may be given at succeeding attacks, in the hope of producing the desired therapeutic effect without diarrhea.³ The patient should be advised to have it on hand at all times.

SUMMARY

A case of gout with three unusual features is presented, and the clinical aspects of the disease are discussed.

The opinion is expressed that, if physicians become aware of gout as a serious possibility in the differential diagnosis of arthritis, the disease will not infrequently be recognized.

743 High Street.

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CASE RECORDS OF THE FAULKNER HOSPITAL

Antemortem and Postmortem Records as Used in Monthly
Clinicopathological Conferences*Directed by J BEACH HAZARD, MD*

CASE 6377

PRESENTATION OF CASE

A fifty-four-year-old American housewife was admitted because of gradually increasing weakness and the finding of sugar in the urine.

For over a period of several months the patient had been "going down hill." Her appetite had been poor and there had been a very marked loss of strength and, it was believed, weight. She had experienced some pain in the left lower back but there had been no abdominal pain. A rather marked thirst had been noted and one month before admission sugar had been found in the urine. There was no dysuria or polyuria. Just previous to entry there had been some incontinence of urine.

In the past there had been no serious illnesses except diphtheria in childhood. The history in respect to heart, lungs and kidneys was negative. There had been no previous history of diabetes. The patient had had four children, and there had been one or two miscarriages.

Physical examination showed a rather pale woman of middle age. Temperature on admission was 96.0°F, pulse rate, 84, respirations, 24, and blood pressure, 140 systolic, 80 diastolic. Head, ears, eyes, nose and throat were negative. The vessels were moderately sclerotic. The heart was enlarged to the left and presented a rough, apical systolic murmur. There were a few rales at both lung bases. Palpation of the abdomen revealed a large, non-tender mass in the left upper quadrant, which was interpreted as being spleen and also a questionable mass in the midepigastrium. The extremities were negative.

Admission urine showed a specific gravity of 1.008, was clear, straw colored and acid, and showed the slightest possible trace of albumin and a slight trace of sugar. No erythrocytes were present in the sediment but many leukocytes were found. The white-blood count was 17,500 with 81 per cent polymorphonuclears. The red-blood count was 3,700,000 with a hemoglobin of 69 per cent (Sahli). Erythrocytes showed a slight anisocytosis but otherwise appeared normal, as did the platelets. Stool examination was negative. A blood

nonprotein nitrogen done two days after admission was 30 mg per cent. Blood sugar on admission was 283 mg per cent. A blood Hinton test was negative.

During the evening of entry the patient's temperature rose to 102°F and during the first four teen days of her stay continued to fluctuate between 99 and 103°F. While in the hospital she got along very well on from 5 to 10 units of insulin a day. Four days previous to death her blood sugar was 182 mg per cent.

An x-ray examination was made five days after admission. A flat film of the abdomen showed the right kidney outline to be fairly well demarcated and of about normal size and position. A mass was visible in the left flank which was about 12 cm in diameter and lay just above the iliac crest. The kidney outline on the left was not clearly demarcated. An apparently normal spleen shadow was seen. The stomach was in median position and showed normal tone and peristalsis and no irregularity or defect, and no evidence of pressure defect. The duodenum was normal throughout. A barium enema showed a colon which filled easily, the splenic flexure was displaced downward, and with the patient lying on her back, there was a pressure defect at the proximal end of the splenic flexure. With a picture taken face down this defect was relieved. Films of the chest showed a slight elevation of the left diaphragm. There was a slight increase in normal lung markings at the left base, but no evidence of consolidation or metastases. The heart was enlarged to the left, and the aortic knob was prominent. Cystoscopic and pyelographic examinations were done five days after admission. A flat film showed the left catheter to extend only to the superior level of the body of the fifth lumbar vertebra. Following injection, a very low lying kidney with a sharp angulation at the ureteropelvic junction was seen. There was a slight pressure defect involving the superior aspect of the pelvis and the upper calyx. Urine from the left kidney showed numerous red blood cells, numerous leukocytes and frequent epithelial cells, and the specimen from the right kidney contained innumerable erythrocytes and leukocytes and showed numerous epithelial cells. A culture of the left ureter and a specimen of the bladder urine showed *Bacillus coli*.

and *Staphylococcus albus*. A Widal test performed eight days after admission was negative.

Four days before exitus the physical signs in the lungs cleared up. The blood nonprotein nitrogen was 31 mg per cent. At this time the patient's temperature returned to normal and so remained until just before death, when it rose to 102°F. Extreme weakness persisted throughout her stay in the hospital. Death occurred eighteen days after admission, was sudden and unexpected, and was preceded by a convulsion involving chiefly the left side of the face, left leg and left arm.

DIFFERENTIAL DIAGNOSIS

DR. F. WILLIAM MARLOW, JR. I think we can at once rule out uncomplicated diabetes as the entire explanation, since that would be too simple. The incontinence of urine is a symptom which cannot be lightly passed off. Incontinence may mean involvement of the spinal cord, it may be associated simply with weakness of the patient although that is not suggested by the preceding history. As the extremities were negative, one must assume that there was no serious spinal-cord lesion. A blood pressure of 140 systolic, 80 diastolic, in a person who has had progressive weakness, is suggestive to me that she may well have had a higher blood pressure at a previous time. The heart was enlarged to the left, and the aortic knob prominent, these are findings consistent with a hypertensive arteriosclerotic type of heart. There were a few rales at both lung bases. One wonders whether there was dullness or whether the rales were more than the few scattered ones which many elderly people have without any pathological evidence of disease. Palpation of the abdomen revealed a large, non tender mass in the left upper quadrant which was interpreted clinically as being spleen. This is the first mentioned physical sign which could not be associated with her diabetes. The laboratory findings help us to the extent of indicating that there is a chronic process which has reduced the blood count, and this suggests that there is a background of infection contributing to the patient's immediate history.

It is unfortunate that a blood culture was not taken, and I should like to know what the repeat white counts were.

DR. J. BEACH HAZARD. The admission white count was 17,500. Seven days later the count was 17,000, three days later, 10,250, and five days later 13,850.

DR. MARLOW. During the evening of the day of entry the patient's temperature rose to 102°F and during the first fourteen days of her stay continued to fluctuate between 99 and 103°F. Extensive carcinoma occasionally will give a swinging temperature of that extent. I think it very rare, however,

except when the cancer produces marked emaciation and when there is evidence of many metastases throughout the body. So that with the elevated white count one must question very seriously whether an infectious background in this picture is not an important consideration. Typhoid fever was considered, and a negative Widal found. A negative Widal does not necessarily prove anything, although it is contradictory to the idea that this patient had typhoid fever. The possibility of a localized abscess in the abdomen should be considered. One cannot help wondering whether bacterial endocarditis was present, even though the heart is not of the type usually associated with this disease.

Then we come to a consideration of the x-ray findings, which showed a large mass in the left flank. What could it be? An enlarged spleen ordinarily rides in front of the colon, on abdominal palpation. The kidney comes in ordinarily from behind and usually does not displace the colon unless the mass is very large. One thinks of the possibility of a lymphoma in the posterior abdominal cavity. Carcinoma of the head of the pancreas or a cyst of the pancreas are possibilities but one would think that the duodenum should be displaced or show a pressure defect. Films of the chest showed a slight elevation of the left diaphragm. I wonder whether it was fixed. A mass in the abdomen can cause an elevated diaphragm, but if that mass is of an inflammatory nature, one would expect the diaphragm to be fixed as compared with the movement on the right.

Cystoscopic examination done five days after admission showed the kidney to be placed abnormally low on the left side. One recalls that a floating kidney is six times as common on the right as on the left so one would assume that this is not a simple floating kidney and that there must be something pushing the kidney down. Is it a tumor of the kidney itself or is there some other abnormal process behind the kidney, pushing it down? The next statement is that the pelvis and calices themselves were within normal limits. The most common tumor of the kidney is hypernephroma. One characteristic change which hypernephroma causes, in addition to displacement, is a drawing out of the pelvis, not a compression, so that one may assume that this patient did not have a hypernephroma. A pressure defect means that the tumor was pressing on the kidney rather than being in the kidney itself. Urine from both sides was essentially the same, both specimens showing numerous red cells and leukocytes. The numerous red cells on the left following cystoscopy might be purely the result of trauma. Therefore, one cannot pay a great deal of attention to that. However, the presence of epithelial cells and leuko-

cytes is evidence of kidney-parenchyma involvement and I am wondering if there may have been a generalized infection involving the kidney. A culture of the urine from the left ureter and a specimen of bladder urine both showed *Bacillus coli* and *Staphylococcus albus*. One usually does not pay much attention to *Staphylococcus albus*, but I cannot help regarding it with suspicion.

Four days before death, physical signs at the bases of the lungs cleared up. In spite of that, however, I should suspect that we should find some bronchopneumonia as a part of the terminal picture. The final episode with a convulsion evidently indicates a process involving the right hemisphere and presents two main possibilities. The first is a cerebral accident on a vascular basis, though this is unusual in a fifty-four-year-old woman with a normal blood pressure and with no evidence of syphilis. The other possibility is embolus. In a patient who has diabetes and who dies suddenly, one would like to have known the blood carbon-dioxide-combining power and the results of tests for acetone bodies in the urine. These were probably not done since the diabetes was extremely mild. I will say that there was some kind of a lesion in the left upper abdomen, with secondary infection and abscess formation. The terminal cerebral embolus may be secondary to an acute endocarditis, and the pus and red cells in the urine may also be explained on an embolic basis. The possibility of septicemia should not be overlooked.

DR. MAGNUS I. SMEDAL: The left diaphragm is a little bit high, but we called the lung fields and chest normal except for that. The esophagus and stomach are perfectly normal. There is no evidence of an enlarged spleen shadow or of an enlarged pancreas. The splenic flexure is displaced downward. With the patient on her back there is a defect in the splenic flexure, but facing downward this is relieved. The kidney is intrinsically negative. Pressure from hypernephroma causes more deformity, it may elongate the calyx but the common occurrence is to destroy by direct pressure. This kidney looks as if there were some mass pushing it up rather than a mass within the kidney itself. We believed there was a retroperitoneal mass, displacing the kidney and the splenic flexure downward. It is not spleen because there is no defect in the stomach.

DR. EDWARD L. YOUNG, JR.: Could it be a cyst of the tail of the pancreas, the infection of the kidney being the cause of the leukocytosis and temperature and entirely incidental to the mild back pressure in the kidney due to its being pushed down?

CLINICAL DIAGNOSES

Diabetes
Pyelonephritis?
Perinephritic abscess?
Retroperitoneal tumor?
Cerebral embolus

DR. MARLOW'S DIAGNOSES

Diabetes
Cerebral embolus
Abscess formation, left upper abdomen
Acute endocarditis with septicemia?
Embolic nephritis?

ANATOMICAL DIAGNOSES

Perinephritic abscesses, bilateral
Chronic pyelonephritis, bilateral
Cirrhosis of liver, alcoholic type
Ascites, slight

DR. HAZARD: The answer to the whole problem is perirenal abscess. There was a large abscess on the left side, a smaller abscess on the other side and a bilateral suppurative nephritis. The organism recovered from the kidneys and abscesses was *Staphylococcus aureus*. Culture of blood from the heart was negative. Other pathological findings were cirrhosis of the liver of the alcoholic type and a beginning ascites. Those are the main diagnosis and the symptomatology was due to the perinephritic abscesses. Sometimes these can be present without anything in the urine, and in a number of instances the only feature they may show is febrile reaction. This diagnosis is one we are all prone to forget in considering a case that shows fever of unexplained origin.

DR. ROBERT SANDERSON: What was the cause of death in this case?

DR. HAZARD: Due to restrictions the brain was not examined, so that I cannot tell you the cause of her death.

DR. MARLOW: Was the heart of the hypertensive type?

DR. HAZARD: No.

DR. LLOYD T. BROWN: On physical examination, was there any costovertebral tenderness?

DR. HAZARD: Unfortunately the record does not mention that. It is said to be a non-tender mass, but there is no statement as to whether a definite attempt was made to demonstrate costovertebral tenderness.

DR. BROWN: I saw a case similar to this that caused a good deal of discussion. The patient showed a similar fluctuating temperature, and palpation of the costovertebral region revealed a very

tender spot. Often that is the only thing on physical examination that gives much help

DR. JOHN J. SACCO I was wondering if the patient was offered an exploratory operation at any time.

DR. HAZARD No Operation was thought of, but the patient's condition was so very poor that she was not considered a good surgical risk

CASE 6379

PRESENTATION OF CASE

First Admission An eighty-year-old, retired clergyman entered the hospital with the complaint of pain in the back

Until three months before admission, while living in the South, he had been perfectly well but at that time began to feel tired and somewhat depressed. His wife attributed this to the recent death of a sister and a brother. Six weeks before admission he developed a cold which persisted for a month and was accompanied by a low-grade fever. He motored North but was forced to stay in bed for ten days on the way. At this time he had some cramps in his legs. Two weeks before admission he came to Boston and began having persistent pain in the lower lumbar region radiating around the abdomen on both sides. This was relieved by hot applications and aspirin. His bowels, always constipated, became more so. He had had a poor appetite for three months but had no nausea or vomiting, there had been a good deal of gas and some indigestion, which were relieved by having bowel movements, usually obtained by enemas. He had lost about 10 lb in weight.

A sister died six months before admission with what was thought to be a ruptured abdominal aneurysm. One brother died a year previous to entry. He had two sisters living and well.

His past history was negative except for lifelong constipation. He had always been rugged. Seven years before he entered the hospital a diagnosis of hypertrophic arthritis of the spine was made.

Physical examination revealed a rather obese man with good color who did not look very ill but had obviously lost weight. The heart was normal. The blood pressure was 130 systolic, 80 diastolic. The lungs were clear, but there were signs of moderate emphysema. The abdomen was soft with slight tenderness in both lower quadrants. There were no masses or organs palpable and no spasm. The knee jerks were normal, and the extremities negative.

The temperature was 100.6°F., the pulse 80. The respirations were 19.

One urine specimen showed a specific gravity of 1.020, a trace of albumin, no sugar, from 4 to 6

red blood cells per high-power field, rare white blood cells, and no casts. Several white-blood-cell counts ranged from 10,850 to 19,000 with differential counts of polymorphonuclears from 27 to 60 per cent, lymphocytes from 38 to 53 per cent, and monocytes from 7 to 8 per cent. One smear had 3 per cent young polymorphonuclear cells. The red-blood-cell count was 5,000,000 with 98 per cent hemoglobin (Sahli). One stool examination was negative. X-rays showed marked degenerative changes in the spine with a right lumbar scoliosis, marked arteriosclerosis of the iliac and femoral vessels, a negative colon by barium enema, and no abnormal shadows in the flat plate of the abdomen.

He remained in the hospital for four days during which time his temperature rose to about 100.8°F each evening, being normal the following morning. His pulse varied between 70 and 80.

Second Admission (two weeks later) The interval history revealed that the symptoms of backache and constipation with mild abdominal distress and the low-grade fever had continued. The urine on one examination for Bence-Jones protein was positive. Eight days after discharge he had sudden severe pain in the left popliteal space, and a large pulsating swelling appeared in this area. The left leg became swollen and tender, but the foot was normally warm. Neither dorsalis pedis artery was palpable. Three days after this event the patient was admitted to the hospital where the femoral artery was ligated just below the profunda femoris artery. He responded satisfactorily: the pulsation ceased, the leg remained warm, and the swelling gradually subsided. While in the hospital an agglutination test for undulant fever was positive in a serum dilution of 1:640. The blood nonprotein nitrogen was 43 mg per cent, the serum protein 6.5 gm per cent. A test for Bence-Jones protein was repeated and was negative. He remained in the hospital for four days during which time he had an evening rise in temperature to 100°F.

Three days after discharge from the hospital he went to a nearby summer resort by ambulance where he remained three months. After three weeks he was able to walk, but he developed a foot drop. He was given antitubercella serum by his local physician with a resultant severe reaction but after this the fever disappeared and he improved considerably in weight and appetite, and was able to be more active. His digestive symptoms improved. The undulant fever agglutination test was repeated and remained positive in high dilution. Ten days before returning from his summer home his physician felt a very hard, apparently pulsating mass in the right upper quadrant. The day after he returned home he had a severe attack of persistent vomiting which was relieved by morphine. The next day

cytes is evidence of kidney-parenchyma involvement and I am wondering if there may have been a generalized infection involving the kidney. A culture of the urine from the left ureter and a specimen of bladder urine both showed *Bacillus coli* and *Staphylococcus albus*. One usually does not pay much attention to *Staphylococcus albus*, but I cannot help regarding it with suspicion.

Four days before death, physical signs at the bases of the lungs cleared up. In spite of that, however, I should suspect that we should find some bronchopneumonia as a part of the terminal picture. The final episode with a convulsion evidently indicates a process involving the right hemisphere and presents two main possibilities. The first is a cerebral accident on a vascular basis, though this is unusual in a fifty-four-year-old woman with a normal blood pressure and with no evidence of syphilis. The other possibility is embolus. In a patient who has diabetes and who dies suddenly, one would like to have known the blood carbon-dioxide-combining power and the results of tests for acetone bodies in the urine. These were probably not done since the diabetes was extremely mild. I will say that there was some kind of a lesion in the left upper abdomen, with secondary infection and abscess formation. The terminal cerebral embolus may be secondary to an acute endocarditis, and the pus and red cells in the urine may also be explained on an embolic basis. The possibility of septicemia should not be overlooked.

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CLINICAL DIAGNOSES

Diabetes
Pyelonephritis?
Perinephritic abscess?
Retroperitoneal tumor?
Cerebral embolus

DR. MARLOW'S DIAGNOSES

Diabetes
Cerebral embolus
Abscess formation, left upper abdomen
Acute endocarditis with septicemia?
Embolic nephritis?

ANATOMICAL DIAGNOSES

Perinephritic abscesses, bilateral
Chronic pyelonephritis, bilateral
Cirrhosis of liver, alcoholic type
Ascites, slight

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DR. BROWN: I saw a case similar to this that caused a good deal of discussion. The patient showed a similar fluctuating temperature, and palpation of the costovertebral region revealed a very

DR. MAURICE B. STRAUSS Were blood cultures taken?

DR. J. BEACH HAZARD No

DR. JAMES A. HALSTED I took care of this patient. On his first admission it was thought that the back pain, fever and unusual blood counts were suggestive of metastatic carcinoma of the vertebrae. When the agglutination tests were found to be positive at the second admission it was felt that undulant fever adequately explained all his symptoms, including the back pain, inasmuch as that disease may produce joint pain. Two months later, when the abdominal tumor was discovered, it was concluded that he had two diseases—the tumor, which must have been present for some time before it became palpable, was judged to be responsible for his backache, and the brucella infection for his fever.

DR. EUGENE E. O'NEIL I think it is particularly interesting to have circulation return so quickly after ligation of a main vessel in a man of this age who has, obviously, generalized arteriosclerosis. We have great difficulty, or I think we have great difficulty, in trying to improve collateral blood supply in such a condition, and if this leg had been put in a vasculator or some similar type of apparatus following the operation, we might have falsely ascribed the improvement to the apparatus. One would expect that this patient would go on to death as a result of gangrene of his leg.

CLINICAL DIAGNOSES

Abdominal aneurysm, arteriosclerotic, with rupture
Undulant fever
Popliteal aneurysm, arteriosclerotic
Arteriosclerosis

DR. GARREY'S DIAGNOSES

Abdominal aneurysm, arteriosclerotic, with rupture
Undulant fever
Popliteal aneurysm, arteriosclerotic
Advanced arteriosclerosis

ANATOMICAL DIAGNOSES

Aneurysm of the abdominal aorta, arteriosclerotic, with rupture
Hemoperitoneum
Focal inflammatory lesions of liver (consistent with undulant fever)
Arteriosclerosis, marked
Benign nephrosclerosis
Distention of lacteals of small intestine, secondary to aneurysm in mesentery
Old perisplenitis
Benign hypertrophy of the prostate

PATHOLOGICAL DISCUSSION

DR. HAZARD The mass in the abdomen was a ruptured aneurysm of the abdominal aorta. It is interesting to see how much clot can be present without obstruction of the vessel lumen. The aneurysm perforated anteriorly through the mesentery, into which it had previously ruptured. There was a large amount of arteriosclerosis in the aorta and the iliac arteries. As to the etiology of the aneurysms, I went through all the cases of undulant fever I could find in the literature for the past decade, and in only one instance was there a case that had died from rupture of an artery. That was a case of rupture of a mycotic aneurysm of a cerebral artery. So far we have not been able to demonstrate organisms in the sections of the wall of the aneurysm. We are apparently dealing with a man that had two diseases—a very marked arteriosclerosis, with the unfortunate addition of an aneurysm, and undulant fever. There were large atheromatous abscesses in the intima of both the aorta and the iliac vessels. Examination was limited to the abdomen, and the popliteal artery could not be examined. There was no occlusion of the renal artery. The kidneys showed rather marked benign nephrosclerosis.

DR. HALSTED I should like to add that the family history in this case is exceedingly interesting inasmuch as the patient's sister, whom I saw, undoubtedly died of this same disease, namely ruptured abdominal arteriosclerotic aneurysm.

he experienced a shaking chill with a temperature rise to 102°F, but it dropped to normal the next day. Following this he began to have rather severe and persistent abdominal pain which increased on moving in bed. The mass seemed to be larger and was definitely pulsating. At this time he developed persistent hiccoughs which were temporarily relieved by withdrawal of two quarts of green-stained fluid by stomach tube. A guaiac test on this fluid was negative. Carbon-dioxide inhalations at intervals for a week were necessary to relieve the hiccoughs. His condition became progressively weaker. The blood nonprotein nitrogen was 67 mg per cent, the red-blood-cell count 3,000,000, and the hemoglobin 60 per cent (Sahli). The urine contained many granular casts. On the twentieth day after his return, two intravenous injections of 1000 cc. of 10 per cent glucose resulted in marked improvement. The urinary output increased, and the urine contained neither casts nor leukocytes. His blood pressure was 120 systolic, 80 diastolic. Two days after this, the patient's temperature rose to 103°F. The lungs were clear, there was no evidence of phlebitis and no change in the abdominal mass. The fever persisted, with an afternoon rise to 103°F.

At noon, twenty-five days after returning from his summer home and eight months after the onset of his illness, he had a sudden sharp pain in his abdomen and died within five minutes.

DIFFERENTIAL DIAGNOSIS

DR. WALTER E. GARREY: On the first entry to the hospital, we have an elderly man who has been sick for three months with recurrent fever, back pain and cramps in his legs. On the second entry there is a story of very sudden severe pain in the left popliteal space, a large, supposedly pulsating, swelling in this region, and a swollen tender left leg with a foot that was normally warm. Neither dorsalis pedis artery was palpable. The left femoral artery was ligated during the second admission, and following that the pulsation ceased, the leg remained warm, the swelling gradually subsided, and after three weeks he was able to walk although a foot drop developed. While he was in the hospital an agglutination test for undulant fever was done and was positive in a serum dilution of 1:640.

As an explanation of the fever, there seems to be sufficient evidence to make a diagnosis of undulant fever. He was in the South where the pasteurization of milk is not a legal requirement, and he ran a course that is compatible with undulant fever. The agglutination test is quite significant because the dilution of 1:640 is a very high titer and he had not received antibrucella vaccine prior to this test. It might have been the result of an old infection

with undulant fever, but his past history is supposed to be negative for any such illness. So, I think we may say that it was active undulant fever. The agglutination test for brucellosis was repeated later and was again positive in high dilution.

It is fairly definite that he developed a popliteal aneurysm between the first and second admissions, that this aneurysm developed suddenly and extensively enough to embarrass his venous return and to press on his peroneal nerve, and that because it was felt that there was an emergency,—a threatening of the foot because of venous congestion and pressure on the nerves in the popliteal space,—a ligation was done, which was apparently successful. This observation of the pulsating tumor appears to be correct, and there is nothing else to be considered.

I suppose there was some conjecture as to how well an elderly person with advanced arteriosclerosis would stand ligation of the femoral artery and whether he would develop any gangrene in the foot. I imagine that preparations had been made to use the vasculator, if necessary. Probably because this was a sudden emergency, no studies were undertaken to try to prove that there was adequate collateral circulation.

The second pulsating mass that developed in the abdomen after he had left the hospital for the second time is probably another aneurysm, and his death was probably due to its rupture. There seems to be an element of renal failure, which contributed to the final picture.

Now it is interesting from the anatomical point of view to speculate as to what the origin of these aneurysms might be. I think that with his advanced arteriosclerosis there is reason to believe that these aneurysms were on an arteriosclerotic basis. A popliteal aneurysm with this etiology and of a size to cause so many symptoms is a rather rare occurrence. I can find no record of an arteriosclerotic popliteal aneurysm in all the cases at the Massachusetts General Hospital, but I think, nonetheless, that this is such a case.

I make my diagnoses: undulant fever, advanced arteriosclerosis, popliteal aneurysm, arteriosclerotic, abdominal aneurysm, arteriosclerotic, with rupture.

DR. EDWARD L. YOUNG, JR.: Might not the nitrogen retention be due to involvement of the orifices of the renal arteries by the aneurysm?

DR. GARREY: I suppose that is possible.

DR. CHANNING FROTHINGHAM: Here is a man that is running a fever and has some damage to his blood vessels. Might it not be called a mycotic aneurysm?

DR. YOUNG: Such lesions are very acute, and they perforate quickly.

DR. GARREY: I do not believe that brucella infection ever causes such vessel lesions.

The other cardinal signs of aneurysm, such as tracheal tug and visible expansile pulsation, are not given and presumably were not present. I should like to ask for advice about the significance of the diastolic thrill. In my experience diastolic thrills are extremely uncommon and certainly would not be expected in aneurysm. A diastolic thrill might occur with rupture of the aortic valve. It is reported that a diastolic thrill can be felt occasionally in aortic regurgitation. I know no other cause for diastolic thrill, and it does not help me to make a diagnosis for or against aneurysm. We have no note as to inequality of pulse or blood pressure, which might tell for or against aneurysm, but nevertheless we have known syphilitic aortic disease and pain between the scapulae. It is a constant pain with occasional twinges, which is characteristic of aneurysm, and I shall make that diagnosis although one great argument against it is the fact that she had an x-ray before coming to the hospital which showed only "enlargement of the heart." If she had had a large enough aneurysm to cause her symptoms she should have had a definite shadow by x-ray.

I believe that she has syphilitic aortic disease with aneurysm, aortic regurgitation, a large heart, and probably syphilis of the central nervous system.

DR. TRACY B. MALLORY: We never saw the film that was taken outside. We have a postmortem film, however.

DR. AUBREY O. HAMPTON: These films were taken at six feet with the cadaver upright, and you can see a dilated arch of the aorta with displacement of the trachea toward the right. We have not been able to rely on the size or shape of the heart post mortem. It changes markedly, but it appears enlarged. The lung fields are normal. There is definite dilatation of the arch of the aorta.

DR. HOWARD B. SPRAGUE: I saw this patient in my office a few days before she was admitted, and one interesting thing about the case is the light it casts upon the type of therapy that such a patient may get when treated by irregular practitioners. She had been treated for neuritis in the back for some time by an osteopathist and, I believe, a chiropractor. Not until increasing dyspnea crippled her did she see a physician, who found something wrong with the heart. I think Dr. Fremont-Smith would have been even more ready to make a diagnosis of aneurysm if he had seen the patient, because she presented the picture of superior mediastinal obstruction of moderate degree with venous engorgement and cyanosis of the face and upper part of the body.

There was a combination of cardiac failure and respiratory failure, and fluoroscopy in my office showed a diffuse dilatation of the aorta.

DR. RICHARD C. CABOT: Did you feel the diastolic thrill?

DR. SPRAGUE: I was surprised to read that I cannot recall that I made the observation.

DR. AUSTIN W. CHEEVER: I saw this patient in consultation the day before she died. I felt there was little doubt of the diagnosis and the question came up as to the therapy. It was perfectly futile to give specific therapy in the condition she was in but in case she improved, if I remember correctly, I suggested that she might be given a little bismuth but certainly not iodides or arsphenamine.

CLINICAL DIAGNOSES

Syphilitic heart disease with aortic regurgitation and aortic aneurysm

DR. FREMONT-SMITH'S DIAGNOSES

Syphilitic heart disease
Aneurysm of aorta, syphilitic
Aortic regurgitation
Hypertrophy of heart
Central-nervous-system syphilis?

ANATOMICAL DIAGNOSES

Syphilitic aortitis
Aneurysms of aorta, diffuse and saccular
Aortic insufficiency
Hypertrophy of the heart
Atherosclerosis of aorta

PATHOLOGICAL DISCUSSION

DR. MALLORY: The postmortem on this patient showed a marked syphilitic aortitis with two aneurysms: a diffuse saccular dilatation of the entire ascending aorta, separated by a normal segment in the region of the arch from a saccular aneurysm which projected back against the vertebral column in the first part of the descending aorta. The second aneurysm arose beyond the mouth of the subclavian artery so I do not believe there would have been a difference in pressure in the two arms. The first of the aneurysms, the one that involved the ascending aorta, extended down as far as the aortic valve cusps, and they were slightly separated from each other, although not very markedly involved. The coronary orifices were perfectly patent. The coronaries in syphilitic heart disease are seldom narrowed except at their mouths unless there is marked coincident arteriosclerosis. The myocardium so far as we could make out grossly and microscopically was normal.

DR. CABOT: Could x-ray have shown the second aneurysm if looked at from the side position?

DR. HAMPTON: This is a lateral plate taken post mortem. It does not show it.

DR. PAUL D. WHITE: If a diastolic thrill was felt in this case it seems as though it was probably

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24171

PRESENTATION OF CASE

A fifty-year-old native-born secretary entered the hospital with the complaint of dyspnea and palpitation of six months' duration.

She was feeling very well until about six months before entry, when she first noticed shortness of breath and palpitation on climbing stairs and when lying flat in bed. However, if she lay on her right side she had very little distress. These symptoms became progressively worse, and two months before entry she began to have a constant, dull ache beneath the shoulder blades which radiated around to the anterior chest and was accompanied by occasional sharp twinges of pain lasting only a moment. About six weeks before entry she began to have a dry, hacking, nonproductive cough which persisted up to the time of entry. She continued her activities up until two days before entry in spite of much distress. Finally she was unable to carry on her work, becoming greatly fatigued on the slightest effort. She slept badly although she never had any definite paroxysmal nocturnal dyspnea. She had never noticed throbbing of her neck vessels, or any other significant symptoms. X-rays taken about a week before entry were said to show an enlarged heart.

She had been married for five or six years about twenty-five years before entry. Her husband had been having treatments of some kind over a long period of time. The marriage was terminated by divorce. She denied ever having had rheumatic fever or any other diseases of importance. She had had no children or miscarriages.

Physical examination revealed an obese, dyspneic woman in obvious distress and complaining of interscapular aching pain. The right pupil was round, of moderate size, and reacted sluggishly to light. The left pupil was round, somewhat contracted, and did not react to light. The heart was grossly enlarged to the right and left, and there was an increase in the width of aortic dullness. A low-pitched diastolic murmur could be heard over the aortic area and a systolic murmur could be heard over the second left interspace. A diastolic thrill was felt over the base of the heart. The blood pressure was 175 systolic, 35 diastolic, there was a collapsing Corrigan pulse, and a pistol-shot sound

could be heard over the femoral vessels. The lungs and abdomen were negative.

The temperature was 98.6°F, the pulse 120. The respirations were 33.

The urine had a specific gravity of 1.020 and contained a slight trace of albumin. The blood showed a red-cell count of 4,670,000 with 80 per cent hemoglobin, and a white-cell count of 12,600 with 87 per cent polymorphonuclears. A Hinton test was positive.

An electrocardiogram showed moderate left axis deviation.

During the first three days in the hospital her condition became progressively worse. She gradually became extremely cyanotic with wheezy respirations and coarse rales in her chest. She refused to tolerate an oxygen tent and finally lapsed into unconsciousness and died on the morning of the fourth day.

DIFFERENTIAL DIAGNOSIS

DR. MAURICE FREMONT-SMITH. A fifty-year-old woman has her first attack of progressive cardiac insufficiency. She has an aortic lesion only. There is no history of rheumatic fever. The Hinton test is positive. A diagnosis of syphilitic cardiovascular disease is inescapable. The problem is what type of syphilitic cardiovascular disease it is. Syphilis of the cardiovascular system starts always in the aorta, attacking the media, and causing a gradual dilatation of the aorta, often symptomless, until either aneurysm or involvement of the aortic valves with failure or narrowing of the entrances of the coronaries develops. I do not know whether the rapid progression that is typical of the course of syphilitic heart failure is always due to involvement of the coronary vessels. In any case it is typical of the syphilitic heart that, when decompensation appears, it goes rapidly forward.

The question of aneurysm comes up, chiefly because of the cardinal symptom of aneurysm, persisting pain in the thorax. I believe that aneurysm occurs in about one third of the cases of syphilitic cardiovascular disease. We are not aided very much in the diagnosis of aneurysm by the physical examination. The fact that the pupils are unequal is not much help because the examination is not satisfactory. The record states: "The right pupil was round, of moderate size, and reacted sluggishly to light. The left pupil was round, somewhat contracted, and did not react to light." That leads us to wonder which of these pupils was the more normal. The fact that a pupil does not react to light may mean a blind eye or an old iritis. It is not an Argyll-Robertson pupil. We want to know whether it reacts to accommodation. A dilated pupil on one side may indicate sympathetic stimulation from pressure.

function gave 0 per cent retained. The Graham test was positive, and a gastrointestinal x-ray series was negative except for probable marked liver enlargement. She finally entered this hospital almost in extremis.

Physical examination revealed a very pale, undernourished, obviously very ill woman with definite jaundice of the skin and sclerae. There were diminished breath sounds and slight dullness at both bases. The heart and lungs were otherwise negative, and the blood pressure was 115 systolic, 70 diastolic. Several enlarged lymph nodes were palpable just above the left clavicle. The abdomen was very much distended with fluid through which no masses could be palpated except the liver edge which extended four fingerbreadths below the costal margin. There was no costovertebral tenderness or spasm. There was definite distention of the superficial vessels on the chest and abdomen, and there was pitting edema of the feet and ankles.

The temperature was 98.6°F., the pulse 105. The respirations were 22.

The urine had a specific gravity of 1.032, and contained albumin, 2+ bile and occasional red cells in the sediment. The blood was essentially the same as it was a month before entry. The stools were guaiac negative on two occasions. The fasting blood sugar was 103 mg., the nonprotein nitrogen 30 mg. and the protein 5.5 gm. per cent. The chlorides were equivalent to 99 cc. of N/10 sodium chloride.

In the hospital she ran a steadily downhill course with progressive cachexia, weight loss, jaundice, ascites, edema and occasional nausea and vomiting. She died on the nineteenth day.

DIFFERENTIAL DIAGNOSIS

DR. GRANTLEY W. TAYLOR. Here is a patient who had obviously a variety of conditions the first one of which came on seven years before her final admission and was characterized by right lower-quadrant pain, coming in attacks severe enough to require morphine, and associated with blood in the urine. Whether it was gross or microscopic blood is not stated, but on several subsequent occasions, in fact on all occasions when the urine was examined, blood cells were present. In spite of the negative intravenous pyelogram we have to conclude that she had some constant source of bleeding in the genitourinary tract, and it seems to me that they were perhaps negligent in not studying it a little more intensively. I suppose stone would be the best explanation of the picture, but it is rather hard to explain why a stone or stones were not seen in the x-ray examination. Certainly I cannot make out that this urinary situa-

tion played any conspicuous part in the subsequent development of the case.

Another point that comes up in the past history, with no further reference to the present illness, is her sensitivity to food—an allergic reaction, presumably. The trip to South America raises the question of possible bizarre parasitic diseases, but I do not believe there is anything in the subsequent history to justify bringing that into the picture.

The other conspicuous finding was the positive Graham test. No mention is made of stones. Presumably there was no filling of the gall bladder, and the test was interpreted as indicating a diseased gall bladder. Then she went along with continuing attacks of pain in the abdomen, and on going elsewhere,—although our pelvic examination was negative,—she was found to have salpingitis, ovarian cyst and endometrial implants, from which I infer she had chocolate cysts or something of that sort, and a calcified mesenteric node was removed without any effect on her symptomatology. The uterus was left behind and presumably, therefore, appeared normal, and since it does not enter into the picture later and since there is no history of bleeding or other abnormal behavior, I think we can rule out the pelvic organs as contributing to the final picture. The operator found matted coils of small intestine which were the result of her appendix operation many years before. Presumably the appendix had been removed, or she would have heard from it afterward.

Beginning about a year before her final entry to the hospital she developed a new train of symptoms characterized by loss of weight, fatigue, a continuous right-sided abdominal pain, nausea and vomiting, and enlargement of the abdomen, on examination she showed a beginning secondary anemia and still had a positive Graham test. In the Out Patient Department and in the hospital her stools were consistently negative for blood. The conspicuous findings on physical examination were jaundice, ascites, large nodes palpable above the clavicle, distention of the superficial veins and pitting edema of the extremities, with a negative cardiac examination. We cannot escape the fact that there was something very wrong with her liver. It seems to me that one may say that this was secondary to the diseased gall bladder, as indicated by the positive Graham test. One can certainly consider the possibility that she developed a biliary cirrhosis, although we ought to have more in the way of jaundice in the past history, if that were to be very seriously considered.

associated with an aortic diastolic murmur rather than aneurysm. If a thrill is felt over an aneurysm it would be systolic as well as diastolic.

DR MALLORY: There seemed to be nothing unusual about this case as compared with many similar cases which would have led to a diastolic thrill in this instance.

A PHYSICIAN: Was there erosion of the vertebrae?

DR MALLORY: No, not to any significant extent.

A PHYSICIAN: Was there tracheal obstruction?

DR MALLORY: We could not make it out post mortem. The symptoms suggest that there had been some. The lungs were equally aerated on both sides.

CASE 24172

PRESENTATION OF CASE

A forty-six-year-old, white, American housewife was studied in the Diagnostic Clinic for attacks of abdominal pain and nausea of five years' duration.

About five years before entry she had an initial attack of severe right lower-quadrant pain which radiated toward the vagina. The pain required morphine for relief and disappeared spontaneously. Her physician found blood in her urine at that time, but an x-ray was reported to be negative. During the next five years she had a series of similar attacks which gradually became more frequent and more severe. Her last attack occurred ten days before entry and was accompanied by nausea. The pain was spasmodic in character and lasted about six hours with each attack. She found that enemas and the application of heat to her abdomen gave some relief. She had no dysuria or other urinary symptoms and no jaundice.

Twenty-three years before entry she had had a ruptured appendix which had been treated surgically with complete recovery. She said that all her life she had been mildly sensitive to certain foods, such as eggs, which caused nausea and vomiting. For nine years during her married life she had traveled all over South America with her husband, who was an electrical engineer. She returned to this country four years before entry. Her past history and family history were otherwise negative. During the three years before entry she had gained 30 lb in weight.

Physical examination revealed a well-developed and nourished woman in no apparent discomfort. The heart and lungs were negative, and the blood pressure was 120 systolic, 80 diastolic. There was deep tenderness in the right upper and lower quadrants, without spasm. No masses were made out.

No femoral or inguinal hernia could be detected, and pelvic examination was negative.

The temperature was 98.4°F, the pulse 98.

The urine had a specific gravity of 1.012 and contained occasional red cells and white cells. The blood showed a white-cell count of 8600 and a hemoglobin of 85 per cent. The blood Hinton test was negative. An intravenous pyelogram showed normal kidney outlines. The dye appeared promptly on both sides and demonstrated normal urinary passages. There were no shadows suggesting stone in the region of the gall bladder, kidneys, ureters or urinary bladder. There was a large area of calcification overlying the fifth lumbar vertebra which had the appearance of a calcified node. A gastrointestinal x-ray series showed no evidence of organic disease in the esophagus, stomach or duodenum, but a Graham test of the gall bladder was positive.

No definite diagnosis was made in the Diagnostic Clinic, and for the next six months she continued to have attacks of pain which became almost continuous. At the end of that time, eighteen months before entry to this hospital, her fallopian tubes and ovaries and a mesenteric lymph node were removed at an outside hospital. The pathological report on these specimens was chronic salpingitis, simple cysts of the ovaries, endometrial implant of the ovary, and calcified mesenteric lymph node. The operator could find no gross lesion in the liver and gall bladder region, but there was marked matting of the lower loops of the intestine. Routine laboratory tests done at that time were negative. She had a normal convalescence followed by severe menopausal symptoms, which were treated with Theelin without much relief. In spite of the operation her symptoms continued, and about a year before entry she began to notice loss of weight and easy fatigue. The right-sided abdominal pain was almost continuous, and she also had severe low backache. She had frequent nausea and vomiting and noticed gradual enlargement of the abdomen. Her loss of strength and weight were progressive during the following twelve months. About a month before entry her blood showed a red-cell count of 3,250,000 with 69 per cent hemoglobin, and a white-cell count of 6800 with 73 per cent polymorphonuclears. A catheter urine specimen showed a specific gravity of 1.015 and contained a slight trace of albumin and numerous red cells in the sediment. A phenol sulfonphthalein test of renal function gave 5 per cent excretion in fifteen minutes, 15 per cent in thirty minutes, 40 per cent in one hour, and 55 per cent in two hours. Four stools were negative for blood, amebae or other parasites. The icteric index was 4, and a bromsulphalein test of liver

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The several enlarged lymph nodes above the left clavicle give the show away to the extent that if they were not due to metastatic carcinoma I doubt whether they would have been noted. Enlarged nodes above the clavicle are late metastatic findings from almost any kind of intra-abdominal cancer. Therefore, we shall narrow this field for the sake of discussion to intra-abdominal cancer and we must grope around to find where it was primary. We consider again that she had a negative upper-intestinal x-ray examination and we recall that she had negative stool examinations for blood, and while all these things are not conclusive, they tend to rule out the gastrointestinal tract as the source. We have already covered the reasons for likewise ruling out the genital tract.

We are then left with certain other areas, notably the biliary tree, the pancreas, and so forth. It might be asked why the long-standing hematuria may not be due to some malignant tumor in the kidney. It seems to me it would be rather hard to account for the enlarged liver, the ascites, the jaundice and the nodes above the clavicle on the basis of a primary process involving the kidney. One thing that I deplore the lack of in the record is the fact that the stools were reported as negative for guaiac but no mention is made whether she had bile in the stools. That might be evidence which would be of use. To say that she had carcinoma involving the pancreas with subsequent jaundice and metastases above the clavicle would very adequately explain the entire picture, and I should incline to make that diagnosis. I can think of nothing else that would be a very satisfactory explanation of the whole picture.

DR. TRACY B. MALLORY: The fact that this woman had metastatic carcinoma was fairly obvious, and on the wards they made that diagnosis but did not attempt to name the primary source, other than to suggest that it might be a pelvic organ. Dr. Taylor has given us one possibility. Are there any other suggestions?

DR. RICHARD CHUTE: It seems to me that the red cells constantly appearing in the urine may be of considerable significance and would point in favor of epidermoid carcinoma of the bladder with metastases.

CLINICAL DIAGNOSES

Metastatic carcinoma of liver (Biopsy by peritoneoscopy)
Cancer in the pelvis?

DR. TAYLOR'S DIAGNOSIS

Carcinoma of the pancreas with metastases to the liver and supraclavicular lymph nodes.

ANATOMICAL DIAGNOSES

Renal-cell adenocarcinoma of left kidney with metastases
Tumor thrombosis of renal vein and vena cava
Cholelithiasis
Cholecystitis, chronic.
Ascites
Edema of legs, genitalia and sacral region.
Icterus
Operative wound appendectomy, bilateral salpingo-oophorectomy

DR. MALLORY: There is one point in the history that was not particularly stressed, but it seems to me that it is the most important lead toward the correct diagnosis. That was the presence of prominent superficial veins over the abdomen and lower part of the thorax, which, in addition to the edema of the extremities, should bring up the possibility of thrombosis of the vena cava. That is what we found. The vena cava was completely occluded from the bifurcations of the iliacs up to the point of its entry into the heart, and it was occluded by tumor tissue. The only tumor that, with any regularity and frequency, does this is hypernephroma, and such a tumor was found in the left kidney which was enlarged to a weight of 700 gm. There were extensive metastases to the liver and lymph nodes elsewhere.

A PHYSICIAN: How do you explain the ascites?

DR. MALLORY: By the thrombosis of the vena cava.

A PHYSICIAN: Did the gall bladder show anything?

DR. MALLORY: The gall bladder did contain a few small stones and a great deal of thick bile, so that the positive Graham test was undoubtedly correct.

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THE DRIVE AGAINST CANCER

This month has been set apart by presidential proclamation for a concerted drive against cancer. A mass attack on this disease is essential. Its ravages cannot be prevented by the physician alone or by the patient alone. The early recognition of this important fact, particularly by the late Dr. Robert B. Greenough, has done much for the 400,000 sufferers from cancer now in this country and has saved many from disability and death.

It is unnecessary to call attention to the importance of the cancer problem. There is, however, need to emphasize what has been accomplished and what yet remains to be accomplished in the control of this menace. It is well to realize what advances have been made through the co-operative effort of the medical profession, public-health authorities, and intelligent and enthusi-

astic groups of laymen. In Massachusetts we have four special hospitals for cancer and over twenty cancer clinics. We have alert and interested groups of laymen representing large numbers of organizations co-operating with the Massachusetts Medical Society and the Massachusetts Department of Public Health and looking toward even more adequate cancer control. The widespread effort of the American Society for the Control of Cancer through the past years and its recent special emphasis on the education of women with regard to the dangers of cancer through the Women's Field Army constitute real contributions to the cancer-control program.

It is as important in the education of lay groups to teach them that cancer is curable as it is to teach them other essential facts. To give added emphasis to this important educational aspect, each of the cancer clinics throughout the State is giving this month a session largely devoted to cured cases of this disease—the most concrete evidence of the practical accomplishments of the clinics that we can hope to have.

The death rate in Massachusetts from cancer for women between twenty and sixty years of age has dropped from 119 per 100,000 in 1927 to 112 in 1937. Twenty-four per cent of the patients with cancer are alive ten years after attending the cancer clinics. Last year eighty-six per cent of the patients attending clinics were referred by physicians, and one thousand three hundred and eighty-four physicians attended the sixty-nine teaching clinics.

The Massachusetts Medical Society and the Department of Public Health may well be proud of this record of accomplishment through cordial co-operative effort, and look forward to even more progress in the years to come.

In this number of the *Journal* is an article by Dr. Herbert L. Lombard, covering one of the most fundamental, most controversial and most far-reaching aspects of the whole cancer problem—the role of heredity in relation to the occurrence of the disease in human beings. Dr. Lombard's study of the population of one of our smaller cities has been most careful and most complete. The

The several enlarged lymph nodes above the left clavicle give the show away to the extent that if they were not due to metastatic carcinoma I doubt whether they would have been noted. Enlarged nodes above the clavicle are late metastatic findings from almost any kind of intra-abdominal cancer. Therefore, we shall narrow this field for the sake of discussion to intra-abdominal cancer and we must grope around to find where it was primary. We consider again that she had a negative upper-intestinal x-ray examination and we recall that she had negative stool examinations for blood, and while all these things are not conclusive, they tend to rule out the gastrointestinal tract as the source. We have already covered the reasons for likewise ruling out the genital tract.

We are then left with certain other areas, notably the biliary tree, the pancreas, and so forth. It might be asked why the long-standing hematuria may not be due to some malignant tumor in the kidney. It seems to me it would be rather hard to account for the enlarged liver, the ascites, the jaundice and the nodes above the clavicle on the basis of a primary process involving the kidney. One thing that I deplore the lack of in the record is the fact that the stools were reported as negative for guaiac but no mention is made whether she had bile in the stools. That might be evidence which would be of use. To say that she had carcinoma involving the pancreas with subsequent jaundice and metastases above the clavicle would very adequately explain the entire picture, and I should incline to make that diagnosis. I can think of nothing else that would be a very satisfactory explanation of the whole picture.

DR. TRACY B. MALLORY: The fact that this woman had metastatic carcinoma was fairly obvious, and on the wards they made that diagnosis but did not attempt to name the primary source, other than to suggest that it might be a pelvic organ. Dr. Taylor has given us one possibility. Are there any other suggestions?

DR. RICHARD CHUTE: It seems to me that the red cells constantly appearing in the urine may be of considerable significance and would point in favor of epidermoid carcinoma of the bladder with metastases.

CLINICAL DIAGNOSES

Metastatic carcinoma of liver (Biopsy by peritoneoscopy)
Cancer in the pelvis?

DR. TAYLOR'S DIAGNOSIS

Carcinoma of the pancreas with metastases to the liver and supraclavicular lymph nodes

ANATOMICAL DIAGNOSES

Renal-cell adenocarcinoma of left kidney with metastases
Tumor thrombosis of renal vein and vena cava
Cholelithiasis
Cholecystitis, chronic
Ascites
Edema of legs, genitalia and sacral region
Icterus
Operative wound: appendectomy, bilateral salpingo-oophorectomy

DR. MALLORY: There is one point in the history that was not particularly stressed, but it seems to me that it is the most important lead toward the correct diagnosis. That was the presence of prominent superficial veins over the abdomen and lower part of the thorax, which, in addition to the edema of the extremities, should bring up the possibility of thrombosis of the vena cava. That is what we found. The vena cava was completely occluded from the bifurcations of the iliacs up to the point of its entry into the heart, and it was occluded by tumor tissue. The only tumor that, with any regularity and frequency, does this is hypernephroma, and such a tumor was found in the left kidney which was enlarged to a weight of 700 gm. There were extensive metastases to the liver and lymph nodes elsewhere.

A PHYSICIAN: How do you explain the ascites?

DR. MALLORY: By the thrombosis of the vena cava.

A PHYSICIAN: Did the gall bladder show anything?

DR. MALLORY: The gall bladder did contain a few small stones and a great deal of thick bile, so that the positive Graham test was undoubtedly correct.

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THE DRIVE AGAINST CANCER

This month has been set apart by presidential proclamation for a concerted drive against cancer. A mass attack on this disease is essential. Its ravages cannot be prevented by the physician alone or by the patient alone. The early recognition of this important fact, particularly by the late Dr. Robert B. Greenough, has done much for the 400,000 sufferers from cancer now in this country and has saved many from disability and death.

It is unnecessary to call attention to the importance of the cancer problem. There is, however, need to emphasize what has been accomplished and what yet remains to be accomplished in the control of this menace. It is well to realize what advances have been made through the co-operative effort of the medical profession, public-health authorities, and intelligent and enthusi-

astic groups of laymen. In Massachusetts we have four special hospitals for cancer and over a hundred cancer clinics. We have alert and interested groups of laymen representing large numbers of organizations co-operating with the Massachusetts Cancer Society and the Massachusetts Department of Public Health and looking toward even more adequate cancer control. The widespread effort of the American Society for the Control of Cancer through the past years and its recent special emphasis on the education of women with regard to the dangers of cancer through the Women's Cancer Army constitute real contributions to the cancer control program.

It is as important in the education of laymen to teach them that cancer is curable as it is to teach them other essential facts. To give added emphasis to this important educational aspect, the Massachusetts Cancer Society is holding at the cancer clinics throughout the State during this month a session largely devoted to the cases of this disease—the most concrete evidence of the practical accomplishments of the cancer drive that we can hope to have.

The death rate in Massachusetts from cancer for women between twenty and sixty years has dropped from 119 per 100,000 in 1927 to 87 in 1937. Twenty-four per cent of the patients with cancer are alive ten years after attending the cancer clinics. Last year eighty-six per cent of the patients attending clinics were referred by physicians, and one thousand three hundred and four physicians attended the sixty-nine teaching clinics.

The Massachusetts Medical Society and the Department of Public Health may well be proud of this record of accomplishment through co-operative effort, and look forward to even more progress in the years to come.

In this number of the *Journal* is an article by Dr. Herbert L. Lombard, covering one of the most fundamental, most controversial and far-reaching aspects of the whole cancer problem—the role of heredity in relation to the occurrence of the disease in human beings. Dr. Lombard's study of the population of one of our smallest states has been most careful and most complete.

Journal takes pride in being able to present to its readers this study of the hereditary aspect of cancer as its contribution toward nation-wide efforts at control of this disease

GASTROSCOPY AND PERITONEOSCOPY

ENDOSCOPIES are being more generally used and are assuming an increasingly important role in the practice of medicine. Bronchoscopy, esophagoscopy, thoracoscopy, cystoscopy, and proctoscopy are standardized procedures in their respective fields, and new endoscopic technics, notably gastroscopy and peritoneoscopy, have been reported as being extremely successful.

Although efforts to see the interior of body cavities were made as early as 1795, gastroscopy was not attempted until 1868, when Kussmaul passed a rigid gastroscope in a professional sword swallower. Because of insufficient illumination the examination was unsuccessful. Various types of gastroscopes were then developed, most of them of the straight rigid variety, but as these were difficult to introduce safely into the stomach, gastroscopy developed very slowly. It was not until 1932, when the Wolf-Schindler¹ flexible gastroscope was first demonstrated, that gastroscopy became generally recognized as a safe and valuable method of examination.

Schindler's work on gastroscopy is outstanding. In addition to his part in the invention of the instrument, he has written extensively on the subject in the current literature and has recently published an excellent book on gastroscopy.² Henning³ and Moutier⁴ have also contributed to the literature on gastroscopy. Benedict⁵ at the Massachusetts General Hospital was the first in this country to use the flexible gastroscope and to call attention to its value in the diagnosis of gastric lesions. According to these authors gastroscopy will give information about the gastric mucosa which cannot be obtained by any other method.

Chronic gastritis is the commonest disease of the stomach. Gastroscopy, by showing the finer changes in the mucosa, is indispensable in its diagnosis. By no other method can edema, color

changes, verrucous elevations, erosions and superficial ulcerations be demonstrated. Superficial, hypertrophic and atrophic gastritis can be differentiated. The improvement after liver therapy in the atrophic gastritis associated with pernicious anemia has been shown by gastroscopic examination.⁶ Careful gastroscopic study of the mucosa in patients with unexplained hematemesis has frequently demonstrated a gastritis with erosions as the source of the hemorrhage.⁷ In fact, it is quite probable that in many cases of peptic ulcer with hemorrhage the source of the bleeding is the associated gastritis rather than the ulcer. Thus in the medical or surgical management of gastric or duodenal ulcer, gastroscopic examination is of great importance since it determines the degree of associated gastritis.

Gastric ulcer, especially the superficial ulcer, is being revealed by gastroscopy to be commoner than has been generally supposed. The gastroscope has been positively shown to be of assistance in the differential diagnosis of ulcer and cancer, for in the living tissue ulcer presents a smooth, sharp margin with a clean yellow or gray base, whereas carcinoma presents a nodular or infiltrated margin and a dark, dirty-appearing one. Another field of usefulness for the gastroscope is in the early diagnosis of cancer. When every patient over thirty-five years of age and complaining of anorexia is examined by gastroscopy, there will be an increase in the early diagnosis of cancer. Careful x-ray examination should be performed in all cases. Gastroscopic and roentgenologic examinations are not competitive, but complementary. Only by the use of both methods can the clinician do full justice to his patient. Gastroscopic examination has already added very important information to our knowledge of the stomach and its increasing usefulness is assured.

Peritoneoscopy, although in some respects appearing simpler and more direct than gastroscopy, was not undertaken until 1901, when Kelling⁸ first used a cystoscope to examine the abdominal cavity of a living dog. While the development of gastroscopy was delayed chiefly because of the inherent difficulty of introducing a rigid tube into

the stomach, peritoneoscopy was delayed probably not because it was so difficult but because exploratory laparotomy was so easy. Surgical exploration is certainly easy for the surgeon, but not for the patient. How many physicians would submit themselves to exploratory operation if any other simpler method would give the desired information? Elsewhere in this issue of the *Journal*, Benedict points out that, whereas exploratory laparotomy is a major operation usually performed under general anesthesia, peritoneoscopy is a minor procedure always performed under local anesthesia. Biopsy can be obtained by both methods. Exploration will of course give more complete information than peritoneoscopy in many cases, but in others the latter will give all the information required. If peritoneoscopy is successful, laparotomy may be avoided, if it fails, exploration can then be carried out. The two methods are not in competition each has its own field, and one supplements the other.

Most writers agree that peritoneoscopy is chiefly useful in cases with abdominal cancer, cirrhosis, tuberculous peritonitis, ascites, pelvic tumors and ectopic pregnancy. It may be indicated in any abdominal or pelvic condition where the diagnosis is obscure or where additional information is needed to confirm a diagnosis or to plan treatment.

Ruddock⁹ recently reported five hundred cases examined by peritoneoscopy, with eight complications (1.6 per cent) and one death (0.2 per cent). All the complications were punctures of the bowel or stomach due to adhesions to the abdominal wall, and all were followed by immediate laparotomy and uneventful recovery. The death was due to hemorrhage from insufficient coagulation of a biopsy wound in metastatic carcinoma of the liver. It is the opinion of Ruddock⁹ that "the mobility of the intestines in the living subject is such that they will not sustain injury but will recede or slip aside before the gentle and slow thrust of the trocar." In each case of puncture of the bowel reported by Ruddock, "the trocar could have been removed without soiling the peritoneal cavity, as the bowel was firmly plastered against the parietal peritoneum."

According to Ruddock⁹ the peritoneoscopic accuracy in his tabulated cases was 92 per cent as compared with a clinical accuracy of 64 per cent. The most striking results were in suspected cancer of the liver and ectopic pregnancy.

Any methods as safe and easy to perform as gastroscopy and peritoneoscopy and which will give a very definite increase in diagnostic accuracy are worthy of a permanent place in the practice of medicine. While not intended for use by the general practitioner, both methods should be available in every medical center.

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CHILD HEALTH DAY

This year marks, if not the tenth anniversary of Child Health Day, at least the tenth anniversary of the congressional resolution of May 18, 1928, which authorized the President to proclaim May Day as Child Health Day. The two ideas have become inseparably associated in our minds—the day that marks the incoming of the first really spring month in our northern states, and the day that we have accepted on which to acknowledge our obligation to the oncoming generation.

There is much that we cannot guarantee to the children of the Nation today that we felt, ten years ago, would be theirs by the very fact of American birth—a possibility of peaceful existence, a fighting chance for economic security, stability in government. The foundation that had then been laid was apparently not capable of supporting a permanent structure, but despite our economic quicksands we have continued each year to sink a few caissons that we hope will bear permanent results in the form of improved child health and a greater understanding of the problems of childhood.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS
AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston,

CASE HISTORY No 69 PREMATURE SEPARATION
OF THE PLACENTA

Mrs C M., a thirty-year-old multipara, was admitted to the hospital as an emergency case for the treatment of vaginal hemorrhage of three hours' duration. She was in the seventh month of a pregnancy which had been entirely normal up to the day of entry. She had observed enlargement of the abdomen following the onset of bleeding. External hemorrhage had been slight.

There was no family history of diabetes, tuberculosis, cancer or cardiorenal disease. The patient gave no history of scarlet fever, diphtheria, typhoid or rheumatic fever, and the rest of her past history was also negative. There was no specific catamenial history, and the date of her last period was not recorded.

On physical examination the patient was apprehensive, and the skin cold and clammy, the mucous membranes demonstrated definite pallor. The pupils were equal and active and reacted to light and accommodation. The mouth was clean, and the teeth carious and discolored, the tongue protruded in the midline without tremor. The thyroid was palpable, its contour smooth and symmetrical. The chest expanded normally, and the lungs were resonant, the breath sounds were normal, and there were no rales. The heart was not enlarged, the sounds were of fair quality, and there was a systolic murmur at the apex. The rate was 124, and the blood pressure was 118 systolic, 102 diastolic. Examination of the abdomen disclosed a rounded abdominal tumor, the size of a full-term intrauterine pregnancy, which was tense and tender. Fetal outlines could not be mapped out, and it was impossible to distinguish the fetal heart beat. The pelvic measurements were I C 28 cm, I S 25 cm, E C 19.5 cm, and outlet 9.5 cm. There was only slight oozing of dark blood from the vagina. Rectal examination revealed the cervix to be dilated three fingerbreadths, but not taken up. The presenting part was high.

The patient was transferred to the operating room and prepared for immediate delivery. The cervix was manually dilated under full ether anes-

thesia to admit the closed fist. The fetal membranes were then ruptured, when a large amount of bloody fluid came away. Internal podalic version and breech extraction were performed without difficulty. The baby was stillborn and weighed 4 lb., 3 oz. The placenta was completely separated and was expressed with the membranes intact. There was profuse hemorrhage following its expulsion. Inspection of the cervix revealed deep bilateral lacerations. The tears were sutured with interrupted chromic catgut.

The patient was returned to bed in poor condition. The pulse rate, which had been 160 during delivery, was 144 a half hour later. Two hours after delivery the blood pressure was 85 systolic. She was placed in Trendelenburg position and given caffeine and camphor in oil, 500 cc. of normal saline was given under each breast. A rectal tap was not retained. She did not respond to stimulation and expired three hours postpartum, without transfusion.

Comment This case represents the treatment of separated placenta twenty years ago. Accoucheement forcé was, at that time, a very common operation, and the result illustrated in this case too often occurred. The cervix does not tolerate rapid dilatation. Undoubtedly this patient had a rupture of the lower segment of the uterus as a result of manual dilatation. Today this patient would have been delivered by the conservative method of rupturing the membranes and applying a Spanish windlass. Her blood would have been grouped and cross matched, and a compatible donor would have been available, she would have been transfused, and retransfused if necessary.

LEGISLATIVE NOTES

During the past week the following changes have taken place in the bills before the Legislature in which the Society is interested.

On House Bill 56, which further regulates the conditions under which food may be manufactured, the Legislature has voted 'no legislation necessary.'

House Bill 1852, which is a redraft of House Bill 51, has been passed to be engrossed. This bill relates to the control of diseases dangerous to public health.

Senate Bill 361, a bill to issue certificates of approval of bacteriological laboratories, has been given 'leave to withdraw.'

House Bill 41, requiring the annual licensing of qualified physicians, has been voted 'no legislation necessary' by the Legislature.

House Bills 818 and 819, both relating to the commitment of insane persons, have been reported out of committee. Its report of 'leave to withdraw' has been accepted in the House.

House Bill 1845, a redraft of House Bill 758, has been passed by the Legislature. This bill postpones the effective date of Chapter 247, of the Acts of 1936, to January 1, 1941.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning May 2

BRISTOL SOUTH (Fall River Section)

Monday, May 2, at 4 30 p. m., at the Union Hospital, Fall River Subject Acute Anterior Poliomyelitis—Its Diagnosis and Treatment. Instructor Charles F. McKhann, Jr. Howard P. Sawyer and Robert H. Goodwin, *Chairmen*

ESSEX NORTH

Friday, May 6, at 4 30 p. m., at the Lawrence General Hospital, Lawrence. Subject Acute Anterior Poliomyelitis—Its Diagnosis and Treatment. Instructor R. Cannon Eley. John Parr, *Chairman*

MIDDLESEX SOUTH

Wednesday, May 4, at 4 00 p. m., at the Cambridge Municipal Hospital, Cambridge Street, Cambridge. Subject Puerperal Sepsis. Instructor Christopher J. Duncan. Edmund H. Robbins, *Chairman*

DEATHS

FISHER—EDGAR A. FISHER, M.D., of Worcester, died April 17 at his home. He was in his seventy third year.

Born in Nantucket, he attended Boston University School of Medicine, receiving his degree in 1887. He began his practice in Worcester shortly afterward. About fifteen years ago he gave up general practice to devote his time to surgery. Dr. Fisher was one of the small group that founded Hahnemann Hospital in Worcester, where he was chief of the surgical department, vice president of the board of directors and a member of the governing board of the hospital. Among his affiliations were fellowships in the American Medical Association, the Massachusetts Medical Society and the American College of Surgeons. He held membership in the University Club of Worcester and was a member of the Masonic Order and the Odd Fellows.

His widow survives him.

RAND—RICHARD B. RAND, M.D., of North Abington died April 19. He was in his seventy first year.

A native of Hanover, New Hampshire, he graduated from Dartmouth College and received his degree from Dartmouth Medical School in 1893. Dr. Rand had practiced for forty six years in North Abington.

He was a fellow of the Massachusetts Medical Society and a member of the American Medical Association. He was a member of the Masonic Order.

His widow and two daughters survive him.

WALKER—WILLIAM D. WALKER, M.D., of 121 Main Street, Andover, died April 12. He was in his sixty first year.

A native of St. John, New Brunswick, he was the son of Dr. Thomas Walker, physician surgeon and colonel of the 62d regiment of Canadian militia. He received his degree from Tufts College Medical School in 1905. He served as school physician at Andover for many years and was on the school committee for six years.

Dr. Walker was a fellow of the American Medical Association and the Massachusetts Medical Society. His

memberships included the Lawrence Medical Club and the Essex North District Medical Society, of which he was president.

MISCELLANY

NOTES

The Massachusetts General Hospital announces that the Warren Triennial Prize for the year 1937, founded in 1867 by the late Dr. J. Mason Warren in memory of his father, amounting to five hundred dollars, has been awarded to Dr. Henry K. Beecher for a manuscript entitled "The Physiology of Anesthesia."

In all, twelve essays were submitted in competition from persons in various parts of the United States, England and Germany.

Dr. Beecher at the present time holds the position of anesthetist at the Massachusetts General Hospital.

The following promotions in the faculty at Harvard Medical School, effective next September 1, were recently announced: Fuller Albright, assistant professor of medicine, Samuel L. Gargill, associate in medicine, T. Duckett Jones, associate in medicine, Wyman Richardson, associate in medicine, and John C. Whitehorn, associate in psychiatry.

CORRESPONDENCE

A RESOLUTION

To the Editor—At the meeting of the Boston Society of Psychiatry and Neurology on April 21, the following resolution was unanimously passed and I was instructed to send a copy of it to the Governor, the members of his council, and the *New England Journal of Medicine*:

Inasmuch as the administration of public health is a special branch of medicine, be it resolved that in the selection of the Commissioner of Public Health for the Commonwealth of Massachusetts, the Governor nominate for commissioner a physician who by special training and experience in the administration of public health is qualified to assume the responsibilities of this important office.

H. HOLSTON MERRITT, M.D., *Secretary*

Boston Society of Psychiatry and Neurology

923 Medical Building,
Boston City Hospital,
Boston, Massachusetts

INADEQUATE MEDICAL CARE

To the Editor—May I call attention to an error in the article by Rosco G. Leland, published in the *Journal* of March 24, 1938. On page 519 of that issue Dr. Leland says:

A survey of some 35,600 persons made by the Committee on the Costs of Medical Care showed that 47.1 per cent had no illness over a period of more than a year. The study also showed that 47.9 per cent of these persons had the services of physicians. Only 5 per cent of the persons involved in the survey were presumably in need of medical services but for some reason did not avail themselves of medical care. Perhaps 5 per cent is not too large an estimate of those who because of human characteristics manifested as ignorance, stupidity or prejudice prefer cultism, patent medicine, the advice of friends or relatives or no medical service at all.

The survey made by the Committee on the Costs of Medical Care is contained in Volume 26 (University of Chicago Press, 1933) of its publications. A study of this report shows that 5 per cent is entirely incorrect as a figure indicating the unmet need for medical care among these 38,600 persons. Dr Leland's statement gives the impression that 47.9 per cent of the surveyed population had the services of physicians as required during the year. An examination of the report shows that this is not the meaning of this percentage. The 47.9 per cent includes merely those persons who had a physician one or more times during the year, irrespective of the number or gravity of their illnesses. A woman, for instance, who had one visit from a doctor at the time of delivery, with no prenatal or postpartum care, would be in the 47.9 per cent. A child having scarlet fever, an infected ear and a cut hand at different times during the year, and who had a physician once, would be in the 47.9 per cent.

The article thus misinterprets the "47.9 per cent." The survey showed that this 47.9 per cent of the people reported an average of over one and a half illnesses per person, and that, *measured in terms of the number of illnesses receiving care*, 22.4 per cent of all the illnesses had no care from physicians or anyone else. Moreover, the percentage of illnesses receiving care varied with different income groups. Among persons with family incomes of \$10,000 and over, 7.3 per cent of the illnesses were uncared for. In the \$1200 to \$2000 income group, 25 per cent of the illnesses were uncared for, and in the income group under \$1200, 33.5 per cent.

Thus, the survey from which Dr Leland quotes does not bear out his implication, cited above, that "only 5 per cent of the persons involved in the survey were presumably in need of medical services but for some reason did not avail themselves of medical care." On the contrary, the survey showed that the amount of unmet medical need was much larger than this. Several more recent surveys, such as those just completed by the United States Public Health Service and the California Medical Association, show similar or larger percentages of illness not receiving any medical care and are the more striking because these deal with disabling illnesses only.

MICHAEL M. DAVIS

9 Rockefeller Plaza,
New York City

A WOODEN ARTERIAL CAST

To the Editor In 1683 Roger Williams was buried at the foot of an apple tree. While digging the grave of his grandchild in 1710, the head end was knocked from his coffin, and when his grave was opened in 1860, it was found that rootlets of the tree had invaded the aorta



and shot downward, following the arterial track to and beyond the feet. By the time that the legs were reached there must have been sufficient decomposition for the roots to spread beyond the area of the actual arteries, but the cast is pretty accurate in its upper portion.

This is probably the only known cast in wood of the circulatory system. The relic is preserved by the Rhode Island Historical Society in Providence, the accompany-

ing picture was published in the Society's *Collections* for April, 1936, and is reprinted with its kind permission.

HAROLD BOWDITCH, M.D.

520 Commonwealth Avenue,
Boston.

REPORT OF MEETING

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital on February 8, Dr Henry A. Christian presiding.

The surgical case was presented by Dr P. D. Giddings. The patient, a seventy-year-old white male, had experienced pain, numbness and tingling in both lower legs for the past two years, and had been previously hospitalized because of impending gangrene of his right foot. On entry his feet were found to be cold and cyanotic. In spite of paravertebral alcohol injection at the level of the second lumbar vertebra, resection of the peroneal and sural nerves, and supportive treatment, an area of gangrene developed on the dorsum of the right foot. Dr Elliott C. Cutler discussed the case and stated that amputation of the foot was the advisable procedure.

The medical case was a seventy-one-year-old white female, whose mother had died of anemia at the age of thirty-two, and whose sister had died of pernicious anemia at the age of sixty-nine. One year previously she was seen in the hospital because of recurrent weakness, and her red-blood-cell count was found to be only 900,000. She received intramuscular injections of liver extract, and her red-cell count rose to 2,000,000. Six weeks before her present entry she experienced ataxia, tinnitus, dyspnea and vomiting. Her local physician found her red-cell count to be below 1,000,000 and advised hospitalization. At entry she was found to be dyspneic, pale and slightly icteric, but well oriented. She had an atrophic glossitis, systolic pulmonary and diastolic apical and basal murmurs, diminished to absent vibratory sensation in both legs, absent knee and ankle jerks, and slight ankle edema. The hemoglobin was 22 per cent (Sahli), and the red-cell count 700,000, with a hematocrit of 13 per cent. The blood smear was typical of pernicious anemia in relapse; there were 2.4 per cent reticulocytes. She received 2.0 cc. of concentrated liver extract intramuscularly, and on the seventh day the red-cell count had risen to 2,200,000, and the hemoglobin to 54 per cent; there were 41 per cent reticulocytes. The basal metabolic rate was +33 four days after admission.

Dr Robert T. Monroe remarked that pernicious anemia could make its first appearance at a very late age, and stated that he had recently seen an eighty-six-year-old patient in his first relapse. Dr Christian commented on the elevated basal metabolic rate which is frequently seen in patients with severe anemia, and which falls toward normal with improvement in the condition of the blood. In spite of the marked elevation of metabolism these patients are usually well nourished.

Dr Walter B. Cannon, George Higginson Professor of Physiology, presented the paper of the evening on the subject "The Aging of Some Homeostatic Mechanisms." Dr Cannon pointed out that, as the span of life is being lengthened by the application of our knowledge of hygiene and preventive medicine, more and more persons are reaching the older age groups and the diseases of old age are becoming of increasing importance. Dr Cannon has recently undertaken a study of the changes that occur in the body's ability to maintain a 'steady state'.

with increasing age. As examples of such homeostatic mechanisms he selected the maintenance of constant temperature, blood sugar and acid-base balance.

The first of these mechanisms, heat regulation, shows marked restriction with advancing years. Uniform body temperature is maintained by a delicate balance between heat production and heat loss, either process being accelerated or decreased as the need arises. Observations have shown that the temperatures of elderly people are not much different from those of the young, although there is a steady decrease in heat production with advancing age. Boothby found a progressive decrease in the calories produced per hour per square meter of body surface with increasing age—a decrease amounting to 24 per cent in persons eighty years of age. The explanation for this decrease is possibly due to involuntional changes which occur in the thyroid gland with advancing age, and to the reduced bodily activity and consequent lessened heat production. Elderly persons protect themselves against cold outer environment and decreased heat production by putting on more clothing and by seeking a sheltered existence. The output of heat from the body surface is decreased by atrophy of the skin and partial disappearance of the dermal capillaries. There is also a partial degeneration of the sweat and oil glands, and a thickening of arteriolar walls leading to a less ready discharge of heat from the body surface—factors causing a diminished ability of the aged to withstand high temperatures. This limitation of homeostasis is evidenced by the steady increase in incidence of heat stroke with increasing age.

The constancy of the blood sugar, ordinarily maintained between very definite limits, tends toward greater and greater variation with advancing years. Porter and Langley found that although there was normally no glycosuria in individuals between the ages of thirty and forty, 40 per cent of persons aged sixty to seventy showed an occasional glycosuria. John showed that with increasing age more and more individuals had a diabetic or prediabetic type of glucose tolerance curve.

One of the most remarkably constant factors in the body is the maintenance of the acid-base balance. The pH of the plasma is maintained at 7.4, and variations of only a few tenths of a pH are sufficient to cause tetany or coma. One of the important factors in maintaining this constancy is the ability of the lungs to rid the blood of excess carbon dioxide. With advancing age there is a decrease in the respiratory efficiency of the lungs; the vital capacity at the age of sixty to sixty five is only 80 per cent of the value at thirty to thirty five. The body can no longer take in and push out large quantities of air. Associated with this limitation of vital capacity there is also a limitation of the amount of air that can be breathed in and out during extreme physical effort, and there is a greater tendency for the accumulation of carbon dioxide in the blood in elderly persons. This decrease in respiratory efficiency is due to the weakening of the intercostal muscles and increasing rigidity of the thoracic cage.

With increasing age there is an increase in systolic blood pressure, and loss in the elasticity of the arteries, amounting to a reduction of about 60 per cent in the latter case at the age of eighty. Capillaries lose their ability for ready and complete dilatation, and there is increase in pericapillary connective tissue preventing rapid diffusion of oxygen and waste products between parenchymal cells and capillaries. Limitations of acid-base regulation are contributed to by changes in the heart, which reacts to strain in old age by dilating and thus empties incompletely and inefficiently. The heart of the aged also shows lessened ability to accelerate. These factors decrease the

body's ability to provide adequate circulation for severe strains, and tend to cause the accumulation of waste products. The oxygen carried away from the lungs during maximal work drops some 34 per cent between the ages of seventeen and sixty-three, while the lactic-acid content of the blood in similar circumstances is three times greater in the elderly person.

Dr Cannon's observations of the limitations of the body mechanisms are confirmed by the results reported in competitive sports. Records for the 100-yard dash are all made by young adults, the world record was made by Wykoff at the age of twenty-one. As the requirement for rapid effort becomes less and the demand for endurance and judgment increases, there is an increase in achievement with age, as is demonstrated by the ages of those holding world records in runs of different distances: the records for the 1- to 5-mile runs are held by men from twenty-three to twenty-seven years of age, the 10-mile record was set by Nurmi at the age of thirty-one. The best Marathon performances by De Mar were between the ages of thirty-six and forty-two. Tennis players reach their peak between the ages of twenty-five and thirty, and after that begin to "slow up" in their ability to adjust to severe strain. After the age of thirty-five, baseball players slow up because of the beginning failure of their lungs, hearts and vascular systems.

In summary, Dr Cannon stated that with increasing age the homeostatic mechanisms maintaining the constant *interior milieu* become less able to meet excess demands, and necessitate a more sheltered, less active existence. Involuntional and degenerative changes in the body tissues and organs are responsible for these limitations of homeostasis in the elderly.

NOTICES

MASSACHUSETTS ITALIAN MEDICAL SOCIETY

The next meeting of the Massachusetts Italian Medical Society will be held on Friday, April 29, at the Hotel Kenmore, Boston, at 9 15 p. m. *Note change from usual date of meeting*

PROGRAM

Presentation and Discussion of Medical and Surgical Cases in Practice.

Dr. Arthur B. Emmons, 2d, will speak on the work of the Boston Health League, Inc., on occupational hygiene.

The medical profession is invited to attend.

CARL F. MARALDI, M.D., *Secretary*

NATIONAL HOSPITAL DAY

The New England Hospital Association and the Massachusetts Hospital Association are working together with the National Committee of the American Hospital Association in the observance of National Hospital Day, Thursday, May 12.

Many hospitals are making extensive plans in the observance of this day. Hospitals throughout New England will have "open house" in order that former patients and friends may visit the hospital to see the latest scientific equipment and apparatus used in the modern treatment of patients.

All members of medical societies are urged to cooperate with hospital administrators by taking part in

The survey made by the Committee on the Costs of Medical Care is contained in Volume 26 (University of Chicago Press, 1933) of its publications. A study of this report shows that 5 per cent is entirely incorrect as a figure indicating the unmet need for medical care among these 38,600 persons. Dr Leland's statement gives the impression that 47.9 per cent of the surveyed population had the services of physicians as required during the year. An examination of the report shows that this is not the meaning of this percentage. The 47.9 per cent includes merely those persons who had a physician one or more times during the year, irrespective of the number or gravity of their illnesses. A woman, for instance, who had one visit from a doctor at the time of delivery, with no prenatal or postpartum care, would be in the 47.9 per cent. A child having scarlet fever, an infected ear and a cut hand at different times during the year, and who had a physician once, would be in the 47.9 per cent.

The article thus misinterprets the "47.9 per cent." The survey showed that this 47.9 per cent of the people reported an average of over one and a half illnesses per person, and that, *measured in terms of the number of illnesses receiving care*, 22.4 per cent of all the illnesses had no care from physicians or anyone else. Moreover, the percentage of illnesses receiving care varied with different income groups. Among persons with family incomes of \$10,000 and over, 7.3 per cent of the illnesses were uncared for. In the \$1200 to \$2000 income group, 25 per cent of the illnesses were uncared for, and in the income group under \$1200, 33.5 per cent.

Thus, the survey from which Dr Leland quotes does not bear out his implication, cited above, that "only 5 per cent of the persons involved in the survey were presumably in need of medical services but for some reason did not avail themselves of medical care." On the contrary, the survey showed that the amount of unmet medical need was much larger than this. Several more recent surveys, such as those just completed by the United States Public Health Service and the California Medical Association, show similar or larger percentages of illness not receiving any medical care and are the more striking because these deal with disabling illnesses only.

MICHAEL M. DAVIS

9 Rockefeller Plaza,
New York City

A WOODEN ARTERIAL CAST

To the Editor In 1683 Roger Williams was buried at the foot of an apple tree. While digging the grave of his grandchild in 1710, the head end was knocked from his coffin, and when his grave was opened in 1860, it was found that rootlets of the tree had invaded the aorta



and shot downward, following the arterial track to and beyond the feet. By the time that the legs were reached there must have been sufficient decomposition for the roots to spread beyond the area of the actual arteries, but the cast is pretty accurate in its upper portion.

This is probably the only known cast in wood of the circulatory system. The relic is preserved by the Rhode Island Historical Society in Providence, the accompany-

ing picture was published in the Society's *Collections* for April, 1936, and is reprinted with its kind permission.

HAROLD BOWDITCH, M.D.

520 Commonwealth Avenue,
Boston.

REPORT OF MEETING

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital on February 8, Dr Henry A. Christian presiding.

The surgical case was presented by Dr P. D. Giddings. The patient, a seventy-year-old white male, had experienced pain, numbness and tingling in both lower legs for the past two years, and had been previously hospitalized because of impending gangrene of his right foot. On entry his feet were found to be cold and cyanotic. In spite of paravertebral alcohol injection at the level of the second lumbar vertebra, resection of the peroneal and sural nerves, and supportive treatment, an area of gangrene developed on the dorsum of the right foot. Dr Elliott C. Cutler discussed the case and stated that amputation of the foot was the advisable procedure.

The medical case was a seventy-one-year-old white female, whose mother had died of anemia at the age of thirty-two, and whose sister had died of pernicious anemia at the age of sixty-nine. One year previously she was seen in the hospital because of recurrent weakness, and her red-blood-cell count was found to be only 900,000. She received intramuscular injections of liver extract, and her red-cell count rose to 2,000,000. Six weeks before her present entry she experienced ataxia, tinnitus, dyspnea and vomiting. Her local physician found her red-cell count to be below 1,000,000 and advised hospitalization. At entry she was found to be dyspneic, pale and slightly icteric, but well oriented. She had an atrophic glossitis, systolic pulmonary and diastolic apical and basal murmurs, diminished to absent vibratory sensation in both legs, absent knee and ankle jerks, and slight ankle edema. The hemoglobin was 22 per cent (Sahli), and the red-cell count 700,000, with a hematocrit of 13 per cent. The blood smear was typical of pernicious anemia in relapse, there were 24 per cent reticulocytes. She received 2.0 cc. of concentrated liver extract intramuscularly, and on the seventh day the red-cell count had risen to 2,200,000, and the hemoglobin to 54 per cent, there were 41 per cent reticulocytes. The basal metabolic rate was +33 four days after admission.

Dr Robert T. Monroe remarked that pernicious anemia could make its first appearance at a very late age, and stated that he had recently seen an eighty-six-year-old patient in his first relapse. Dr Christian commented on the elevated basal metabolic rate which is frequently seen in patients with severe anemia, and which falls toward normal with improvement in the condition of the blood. In spite of the marked elevation of metabolism these patients are usually well nourished.

Dr Walter B. Cannon, George Higginson Professor of Physiology, presented the paper of the evening on the subject "The Aging of Some Homeostatic Mechanisms." Dr Cannon pointed out that, as the span of life is being lengthened by the application of our knowledge of hygiene and preventive medicine, more and more persons are reaching the older age groups and the diseases of old age are becoming of increasing importance. Dr Cannon has recently undertaken a study of the changes that occur in the body's ability to maintain a 'steady state

TUESDAY MAY 3

- *9-10 a. m. Boston Dispensary The Relation of the Resistance of the Host to Rheumatic Fever Dr Nathan Epstein
10 a. m. 12.30 p. m. Tumor clinic Boston Dispensary

WEDNESDAY MAY 4

- 9-10 a. m. Boston Dispensary Some Aspects of Human Ovulation Dr John Rock.
1 p. m. Clinicopathological conference. Children's Hospital amphitheater

THURSDAY MAY 5

- *9-10 a. m. Boston Dispensary General Joint Examination Dr Thomas H Peterson.
5 p. m. Faulkner Hospital Clinicopathological conference.

FRIDAY MAY 6

- *9-10 a. m. Boston Dispensary Diagnosis of Multiple Myeloma Dr Bernard Jacobson
10 a. m. 12.30 p. m. Tumor clinic Boston Dispensary

SATURDAY MAY 7

- 9-10 a. m. Boston Dispensary Hospital case presentation Dr S J Thannhauser
The usual staff rounds at the Peter Bent Brigham Hospital conducted by Dr Christian will be omitted
Open to the medical profession.

APRIL 29—Cancer clinic Page 706 issue of April 21

APRIL 29—Massachusetts Italian Medical Society Page 745

APRIL 29—Henry Jackson Lecture. Page 746

MAY 3-28—Boston Dispensary Medical Conference Program Page 746

MAY 4—Wachusetts Medical Improvement Society Page 746

MAY 5—Faulkner Hospital clinicopathological conference. Page 746

MAY 12—Pearlclerk Association of Physicians. Hotel Bartlett 95 Main Street, Haverhill 8.30 p. m.

MAY 12—National Hospital Day Page 745

MAY 16 and 17—American Neisserian Medical Society Page 582 issue of March 31

MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston.

JUNE 1 and 2—National Society for the Advancement of Gastroenterology Page 746.

JUNE 6 7 8 and 9—American Association of Industrial Physicians Page 499 issue of March 17

JUNE 10 and 11—American Heart Association Page 707 issue of April 21

JUNE 13-17—American Medical Association. San Francisco

JUNE 13 OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 282, issue of February 10

SEPTEMBER 12-14—American Association for the Study of Gout Page 545 issue of March 24

OCTOBER 17-21—Clinical Congress of the American College of Surgeons New York City

OCTOBER 24-26—Academy of Physical Medicine, Scientific Session Washington, D. C.

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p. m. New Bedford

ESSEX SOUTH

MAY 5—Censors meet at Salem Hospital 3.30 p. m.

MAY 11—Annual meeting Salem Country Club Peabody Dinner at 7 p. m. Speaker and subject to be announced

FRANKLIN

Meeting will be held at the Franklin County Hospital Greenfield at 11 a. m. the second Tuesday of May

HAMPTON

Meeting will be held on the fourth Tuesday in July

HAMPSHIRE

MAY 11—Page 546 issue of March 24

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club Stoneham at 12.15 p. m. on May 11

NORFOLK DISTRICT

MAY 3—Page 746

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

MAY 5—Annual meeting Page 746

PLYMOUTH

Meetings will be held at 11 a. m. on May 19 and July 21

WORCESTER

MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced

BOOKS RECEIVED FOR REVIEW

A Practice of Orthopaedic Surgery T P McMurray 471 pp Baltimore William Wood & Company, 1937 \$5.00

Lectures on the Epidemiology and Control of Syphilis Tuberculosis and Whooping Cough, and Other Aspects of Infectious Disease Thorvald Madsen. The Abraham Flexner Lectures Series No 5 216 pp Baltimore The Williams & Wilkins Company, 1937 \$3.00

Man, Bread and Destiny The story of man's food C. C. Furnas and S. M. Furnas. 364 pp Baltimore The Williams & Wilkins Company, 1937 \$3.00

Le Traitement Radiologique de l'Actinomycose Axel Renander 75 pp Stockholm P. A. Norstedt & Söner, 1937 Swed. cr 8

Hernia Anatomy, etiology, symptoms, diagnosis differential diagnosis, prognosis and the operative and injection treatment Leigh F. Watson. Second edition. 591 pp St. Louis The C. V. Mosby Company, 1938 \$7.50

Heart Disease in General Practice National Medical Monographs Paul D. White. Edited by Morris Fishbein. 338 pp New York National Medical Book Company, Inc., 1937 \$3.00

Le Phénomène de la Guérison dans les Maladies Infectieuses F. d'Herelle. 414 pp Paris Masson et Cie, 1938 75 Fr fr

Les Éléments du Pronostic dans les Maladies Aiguës Notes de pratique A.-B. Marfan. 75 pp Paris Masson et Cie, 1938 20 Fr fr

Traitement des Constipations Fonctionnelles Gabriel Leven et Roland Leven. 88 pp Paris Masson et Cie, 1938 15 Fr fr

Die erkrankten Erkrankungen ihre Klinik, Pathologie und Therapie N. v. Jagic and K. Fellingner 293 pp Berlin and Wien Urban & Schwarzenberg, 1938

The New International Clinics Original contributions clinics and evaluated reviews of current advances in the medical arts Edited by George Morris Piersol. Volume 1, new series 1 322 pp Philadelphia, Montreal, New York J. B. Lippincott Company, 1938 \$3.00

BOOK REVIEWS

Fever Therapy Abstracts and discussions of papers presented at the First International Conference on Fever Therapy March 29, 30 31, 1937 Walter M. Simpson, William Bierman, et al. 486 pp New York Paul B. Hoeber, Inc., 1937 \$5.00

This book is a presentation of abstracts of the papers presented at the First International Conference on Fever Therapy, which was held in New York City in March, 1937. The abstracts are printed in English, French and German, but the discussions are presented only in English.

The volume contains messages of greeting from President Roosevelt, Professor Julius Wagner-Jauregg, Professor A. D. Arsonval and Baron Henri de Rothschild, the latter three being pioneers in this type of therapy. There then follows a discussion of the various methods of producing fever in the body, and it is quite obvious that there is no

clinical demonstrations and lectures that may be of interest to the lay public.

Time has been reserved on the air for May 10 and 11, and medical men have been secured to talk on "Our Hospitals"

JOSEPH P. LEONE, M.D.,
National Hospital Day Chairman,
Massachusetts Hospital Association

NORFOLK DISTRICT MEDICAL SOCIETY

The eighty-eighth annual meeting of the Norfolk District Medical Society will be held at the Hotel Somerset, Boston, on Tuesday, May 3

The business meeting will begin at 6 00 p. m., dinner will be served at 6 45. Following the dinner, there will be a lecture, beautifully illustrated in color, entitled "The Land of the Aztecs. The story of Mexico, ancient and modern," by Dr. Charles H. Tozier, of Winchester

FREDERICK REIS, M.D., *President*
FRANK S. CRUICKSHANK, M.D., *Secretary*

NATIONAL SOCIETY FOR THE ADVANCEMENT OF GASTROENTEROLOGY

The third annual convention of the National Society for the Advancement of Gastroenterology will be held on June 1 and 2 at the Squibb Hall, Squibb Building, 745 Fifth Avenue, New York City

A very interesting program is assured

HENRY KENDALL, M.D., *Chairman*
Program Committee

WACHUSETT MEDICAL IMPROVEMENT SOCIETY

There will be a meeting of the Wachusett Medical Improvement Society on Wednesday, May 4, at the United States Veterans Hospital, Rutland.

PROGRAM

- 4 30 p. m. Inspection of hospital.
- 6 00 p. m. Dinner
- 7 00 p. m. Scientific meeting
 - Presentation of Interesting Cases
 - Bronchiogenic Carcinoma
 - Progressive Muscular Atrophy
 - Foreign Protein Treatment of Iritis
 - Cirrhosis of Liver

W. D. BIEBERBACH, M.D., *President*,
N. S. SCARCELLO, M.D., *Secretary*

FAULKNER HOSPITAL

The usual clinicopathological conference will be held at the Faulkner Hospital for its staff and other interested members of the medical profession on Thursday, May 5, at 5 00 p. m.

There will be a discussion of cases by Dr. James A. Halsted and Dr. Arthur R. Kimpton

BOSTON DISPENSARY

25 Bennet Street, Boston
Lecture Hall, Second Floor, 9 10 a. m.

MEDICAL CONFERENCE PROGRAM, MAY, 1938

- Tuesday, May 3—The Relation of the Resistance of the Host to Rheumatic Fever. Dr. Nathan Epstein
- Wednesday, May 4—Some Aspects of Human Ovulation. Dr. John Rock.

Thursday, May 5—General Joint Examination. Dr. Thomas H. Peterson

Friday, May 6—Diagnosis of Multiple Myeloma. Dr. Bernard Jacobson

Saturday, May 7—Hospital Case Presentation. Dr. S. J. Thannhauser

Tuesday, May 10—Medical History of Appendicitis. Dr. Reginald Fitz

Wednesday, May 11—Hospital Case Presentation. Dr. Thannhauser

Thursday, May 12—Social Service Case Presentation. Mrs. H. B. Hooker and Miss E. Grundy

Friday, May 13—The Course of Heart Disease and the Precipitating Factors of Heart Failure. Dr. C. Sidney Burwell

Saturday, May 14—Hospital Case Presentation. Dr. Thannhauser

Tuesday, May 17—Pathogenic Fungi. Dr. Jacob Swartz

Wednesday, May 18—Hospital Case Presentation. Dr. Thannhauser

Thursday, May 19—Erythema Nodosum. Dr. George E. Currier

Friday, May 20—Hemolytic Streptococcal Infections. Factors of Significance in Prognosis and Treatment. Dr. Chester S. Keefer

Saturday, May 21—Hospital Case Presentation. Dr. Thannhauser

Tuesday, May 24—Clinicopathological Conference. Dr. R. C. Wadsworth and Dr. William P. Murphy

Wednesday, May 25—Hospital Case Presentation. Dr. Thannhauser

Thursday, May 26—X-ray Demonstration. Dr. Alice Ettinger

Friday, May 27—Pulmonary Carcinoma. Dr. Donald S. King

Saturday, May 28—Lipoid Diseases. Dr. Thannhauser

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

The annual meeting of the Norfolk South District Medical Society will be held at the Norfolk County Hospital, South Braintree, on Thursday, May 5, at 12 o'clock noon

Dr. Frederick T. Lord will speak on "Pneumonia"
Election of officers

There will be a censors' meeting at 11 00 a. m.

NAHUM R. PILLSBURY, M.D., *President*,
ROBERT L. COOK, M.D., *Secretary*

HENRY JACKSON LECTURE

The Henry Jackson Lecture for 1938 offered by the New England Heart Association will be given by Louis Hamman, M.D., associate professor of clinical medicine, Johns Hopkins University School of Medicine, at 8 15 p. m. on Friday, April 29, at the Boston Medical Library. His subject will be "The Diagnosis of the Causes of Heart Failure."

The annual business meeting of the New England Heart Association will precede the lecture.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MAY 2

MONDAY, MAY 2

4 p. m. Physicians and medical students are cordially invited to attend a clinic presented by the medical surgical and orthopedic services of the Infants and Children's hospitals in the amphitheater of the Children's Hospital

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NUMBER 18

SULFANILAMIDE IN THE TREATMENT OF ACUTE GONOCOCCAL URETHRITIS CLINICAL AND IMMUNOLOGICAL OBSERVATIONS

WESLEY W. SPINK, M.D.* AND EUGENE A. GASTON, M.D.†

BOSTON

SULFANILAMIDE, originally introduced for the treatment of patients with *Streptococcus hemolyticus* infections, has been reported as effective in other types of bacterial infection, such as those due to the meningococcus and the gonococcus. No attempt will be made in this report to review the voluminous literature pertaining to the use of the drug. This has been adequately done by others^{1 2 3 4 5 6 7}

There are relatively few reports on the use of sulfanilamide in the treatment of gonococcal infections. Dees and Colston⁸ recently summarized their results of treatment in 47 cases with various types of gonococcal infections of the genitourinary tract. In 36 cases, gonococci and the urethral discharge disappeared in less than five days after the administration of sulfanilamide. In 5 cases, although there was a diminution of symptoms, gonococci remained persistently present. In 3 cases there was no clinical response to the drug. In 3 other cases there was a prompt therapeutic response, but with omission of the drug there was a recurrence of symptoms, which disappeared in 2 of the cases when it was resumed. Dees and Colston encountered no serious reactions to the drug, and concluded that it would prove of great value in the treatment of gonococcal infections.

More recently, Reuter⁹ treated 100 cases of varying types of gonorrhea. Recovery occurred in 93 per cent of the fresh cases, and in 88 per cent of the previously treated ones. Reuter observed a number of side effects due to the drug, and sounded a warning against its indiscriminate use. It may be pointed out here that although the Council on Pharmacy and Chemistry of the American Medical Association accepted sulfanilamide in its *New*

and Nonofficial Remedies, they stated that certain undesirable side effects might follow its administration. These include acidosis, jaundice, urticaria, sulfhemoglobinemia, methemoglobinemia, granulocytopenia and hemolytic anemia.¹⁰

The present report is concerned with the results of treatment and with immunological observations in 21 men with acute gonococcal urethritis. The patients were ambulatory. Eight of them had received previous treatment without diminution of their symptoms.

METHODS OF STUDY

The clinical course was carefully followed before and after the administration of sulfanilamide. The diagnosis of gonorrhea was established by the presence of a purulent urethral discharge, stained smears of which revealed gram-negative intracellular diplococci. Subsequent to the administration of sulfanilamide, the patients were examined daily for the first few days, and then at intervals of two to three days. At each visit they were carefully examined and questioned concerning signs and symptoms attributable to the drug. The character of the urethral discharge was noted. A two-glass test of the urine was done. Stained smears of the urethral discharge were studied microscopically for gonococci and leukocytes. If the patient's course progressed favorably, the prostate was massaged, and the prostatic secretion was examined for gonococci and leukocytes.

The second method of approach consisted in serological and immunological observations of the blood. Gonococcal complement-fixation tests were done before the administration of sulfanilamide and at intervals during and after treatment. A blood Hinton test for syphilis was done when the patient was first seen.* The bactericidal action of whole defibrinated blood against strains of gonococci was determined according to the method of

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital; the Department of Medicine, Harvard Medical School; and the Genitourinary Out Patient Department, Boston City Hospital.

Formerly resident physician, Thorndike Memorial Laboratory, Boston City Hospital; now assistant professor of medicine, University of Minnesota Medical School.

*Formerly resident surgeon, Boston City Hospital; now in practice, Framingham, Massachusetts.

The tests were done by the Wassermann Laboratory of the Massachusetts Department of Public Health (Dr. William A. Hinton, director).

unanimity of opinion in regard to the most satisfactory way of producing fever from a therapeutic point of view. From reading these discussions, however, it seems likely that mechanical devices are going to be used more in the future than protein shock or the artificial production of definite disease, such as malaria.

There is a series of abstracts on some of the physiologic changes which occur in the body as a result of induced fever. These studies concern chiefly the effects upon blood volume, acid base balance, chloride balance and reactions in bone marrow, connective tissue and lymph nodes.

The next series of papers covers the effect of fever therapy in miscellaneous diseases. In addition to many individual infections, some of known and some of unknown etiology, this form of therapy has been tried in psychiatric patients and those with ophthalmologic, otolaryngologic and other diseases that are grouped among the specialties. The benefits of treatment in all these diseases are by no means established or claimed by the authors. That it is advantageous in certain infections, such as syphilis and gonorrhea, has been quite definitely proved.

The book awakens one's interest in the possible benefits of fever therapy in the treatment of a variety of diseases.

Radiation Therapy Its use in the treatment of benign and malignant conditions Oxford Medical Publications Ira I Kaplan 558 pp New York Oxford University Press, 1937 \$10 00

The author characterizes this volume in the preface as aiming to give the student and general practitioner, as well as the specialist, an understanding of the fundamentals of irradiation, and enumerates the conditions for which this form of therapy is of value.

The first five chapters are devoted to a brief historical review and to the physics of radium, x-ray and electro-surgical apparatus. There then follows a discussion of the treatment of the more common dermatologic conditions, both benign and cancerous. Two chapters are devoted to eye, ear, nose and throat therapy, a great variety of conditions being briefly touched upon.

Separate chapters are devoted to thoracic lesions, breast conditions, the gastrointestinal tract, gynecologic conditions, the genitourinary system, neurologic conditions, endocrinology, inflammatory conditions, diseases of the reticuloendothelial system, blood dyscrasias, sarcomas of the soft tissues and various bone conditions both primary and metastatic.

Brief mention is made of the complications and injuries following irradiation, of the relation of trauma to cancer, and of the nursing care of patients with cancer.

Most of the technic outlined in this book presupposes a considerable supply of radium, emphasis being placed on the use of radium rather than on x-ray. The author recommends that the radium be distributed in applicators of various lengths and strengths, chiefly with platinum filtration. He advises that radium emanations be purchased whenever needed, and points out that radium treatment can be carried out promptly and efficiently with one gram of radium element properly distributed. Emanation need be used only in the form of gold filtered seeds for permanent implantation in lesions not readily accessible to the temporary application of radium element.

The reviewer feels that many of the procedures for which radium is recommended can be more easily and as effectively carried out with high voltage roentgen rays. However, Dr. Kaplan points out that no attempt has

been made to evaluate or even to present all the different methods in use by other therapists.

Health Insurance The next step in social security Louis S Reed. 281 pp New York and London Harper & Brothers, Publishers, 1937 \$3 00

This book is frankly an argument for compulsory health insurance to meet the cost of medical care for the low income groups.

The preface states clearly the conflicting points of view of the medical profession and the general public concerning the problem of providing adequate medical care.

It is stated in the first chapter that adequate medical care is a service which the community has a right to expect to be provided equally with food, shelter and clothes. It is pointed out, however, that the delivery of medical service differs from all other services in the fact that the persons who seek the service or, to quote the author's words, "buy a commodity, are dependent entirely upon the good will of the physician or 'seller,' and that the services are rendered irrespective of the recipients ability to pay. The idealism of the medical profession has made the continuation of this practice possible, although it is recognized by the profession itself and by the public that the idealism has frequently been sacrificed to practical considerations. Physicians, like other members of the community, must earn a living, and the ability of patients to pay for services rendered has exerted a determining influence on the distribution of physicians, who naturally locate in communities where it is probable that they will receive an adequate financial return for their work.

Economic factors are largely responsible for the failure to meet the needs of the community in both preventive and curative medical care. The greatest difficulty arises in the middle income group from catastrophic illness, which imposes a heavy burden at a given time, and upon those of the lowest income group above the indigent class who cannot pay for ordinary medical service.

The author believes that the established methods of private practice are not adapted to the present social order. The payment for medical services through charitable contributions is not likely to continue to the same degree which has obtained in the past. The Government has already invaded the field to a considerable extent. Voluntary health insurance may be provided for certain emergencies, but compulsory health insurance offers the only satisfactory solution. The medical profession must determine what its attitude shall be. "The physician today stands at a crossroads. Through no fault of his own he has been maneuvered into a position where his traditional spirit and ideals are threatened."

The ultimate solution of the problem lies either in state medicine, supported from general governmental revenues, or an insurance plan adapted to the needs of the people in this country. Changes in the method of payment for medical service need not lead to a lower quality of service. "Once the practice of medicine is put upon a solid economic basis, the profession can see that the quality of service is what it ought to be."

The book presents an excellent statement of a point of view which has a wide following in this country. On the whole, the attitude of the medical profession is sympathetically presented, although not, in every instance, clearly expressed. Most physicians will not agree with the final conclusions, but anyone who is interested in the future development of medical practice will find the book illuminating and readable.

showed evidence of cyanosis. One had fever and diarrhea, which abated when the drug was discontinued.

Since a positive gonococcal complement-fixation test of the blood may indicate the presence of humoral antibodies against the gonococcus, we desired to determine whether the drug had any effect upon the development of antibodies dur-

completed, data on only 15 of them are presented. The bloods of 6 of these patients, before sulfanilamide therapy, showed a bacteriolytic titer considerably increased over that of the bloods of the normal controls. The bloods of four normal controls were constantly ineffective in killing the two strains of gonococci in the dilutions used in this study. In 9 patients the bacteriolytic titer, before

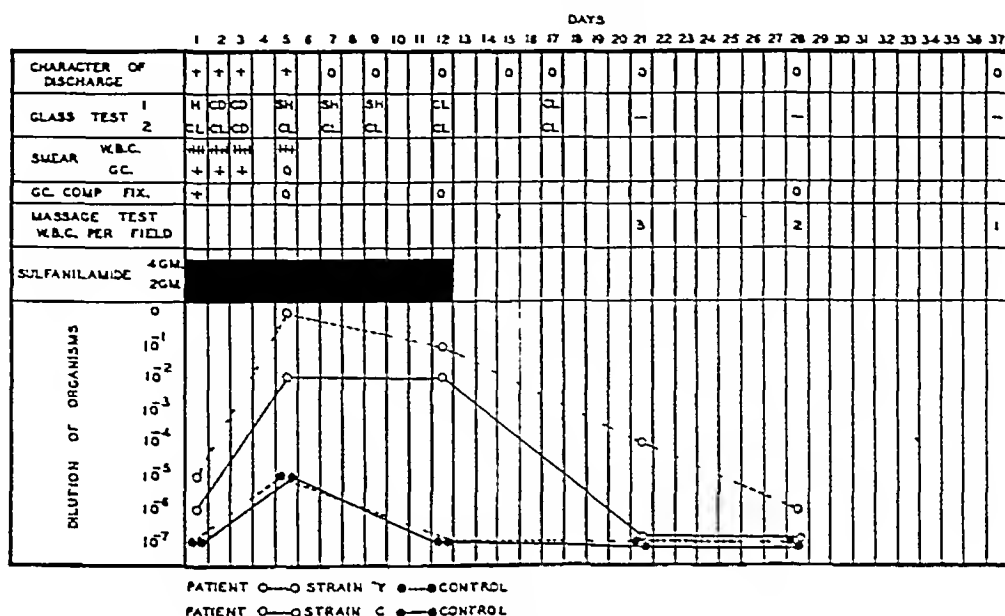


Chart 1 The patient received 4 gm. of sulfanilamide for twelve days with marked clinical improvement. Note the increase in the bactericidal power of the patient's whole blood while the drug was being received.

ing the infection. Several complement-fixation tests were done while the drug was being administered. Nineteen of the 21 patients gave positive reactions while under observation. Nine gave negative reactions before receiving sulfanilamide but positive ones while taking it. Eight had positive tests before and after the drug had been prescribed. Two had positive tests before and negative tests during its administration. Two had negative tests before and after taking. From these observations, it would appear that the demonstration of antibodies against the gonococcus by means of the complement-fixation test is not affected by sulfanilamide.

Two patients had evidence of syphilis. Hinton and Kahn tests were positive before and during the administration of sulfanilamide, which suggests that sulfanilamide therapy does not interfere with serological tests for syphilis.

Further immunological studies were carried out by means of bactericidal tests on whole defibrinated blood. Because some of the patients stopped coming to the clinic before these observations were

receiving sulfanilamide, was the same as that of the normal controls but was greatly elevated during its administration. When it was discontinued the bacteriolytic titer promptly fell to normal.

Chart 1 shows the relation between the bacteriolytic titer of a patient's blood and the administration of sulfanilamide. The course of the infection is also illustrated. Before the sulfanilamide was given, the bactericidal power of the blood was approximately the same as that of a normal control. Four grams was then taken daily for twelve days. The bactericidal power increased during this period. When the drug was discontinued, the bacteriolytic titer again approximated that of the normal control.

Chart 2 illustrates the findings in a patient given 4 gm. of sulfanilamide daily for eighteen days. Again, there was a rise in the bacteriolytic titer while he was taking sulfanilamide, and a fall when it was omitted.

Chart 3 shows a marked rise in the bactericidal power of a patient's blood upon taking sulfanilamide. The patient then failed to report to the

Todd, as used by Spink and Keefer¹¹ in studies of gonococcal infections. By means of this test it was shown that bacteriolysins against the gonococcus develop in the blood of patients during the course of infection. Furthermore, it was observed that the titer of bacteriolysins in the blood could be increased considerably by the addition of immune horse serum, both *in vitro* and *in vivo*.^{11, 12} Thus, in a patient with gonococcemia without endocarditis the blood stream was cleared of organisms following the administration of immune serum. Since the presence of bacteriolysins in the blood appeared to be an aid in the destruction of the gonococcus, it seemed logical to determine whether the administration of sulfanilamide increased the bacteriolytic titer of the blood. If such an increase could be demonstrated, many of the complications following a hematogenous spread of gonococci could doubtless be prevented by giving sulfanilamide. The bactericidal test was performed as follows. Varying dilutions of an eighteen-hour suspension of gonococci in broth were added to 0.5 cc of whole defibrinated blood in small pyrex glass tubes. The number of organisms in each tube was determined by the plating of 1 cc of the contents of tubes with dilutions, 10^{-6} and 10^{-7} . The tubes were sealed in a gas-oxygen flame, and rotated for thirty-six hours in a box in an incubator at 37.5°C . The tubes were then opened and the contents were cultured for gonococci. Two strains of gonococci isolated from patients with gonococcal arthritis were used in performing the tests. It was found that defibrinated whole blood of several normal controls was only slightly bacteriolytic for these strains. Bactericidal tests were carried out on the bloods of patients before the administration of sulfanilamide, while it was being given, and after it had been discontinued. Simultaneous tests were done on the blood of a person without any history or evidence of a gonococcal infection.

TREATMENT

With a few exceptions, discussed below, the only treatment prescribed was sulfanilamide and the forcing of fluids. Most of the patients continued at their daily occupations while under treatment. All were first given 4 gm of sulfanilamide daily in four divided doses. Sometimes the dose was reduced to 2 gm a day so as to determine the effect on the course of the disease, and on the bacteriolytic titer of the blood. The drug was administered for from ten days to three weeks. It was felt that it should be continued as long as evidence of the infection was still present.

RESULTS OF TREATMENT

The criteria for declaring a patient cured were the absence of gonococci in stained smears of pros-

tatic secretions, a complete cessation of the urethral discharge, clear urines by the two-glass method and a maximum of four leukocytes per oil immersion field in stained preparations of prostatic secretions. The prostatic secretions, obtained by massage, were examined on three occasions at intervals of several days. On this basis, there were 11 patients who were declared free of infection four to seven weeks after treatment with sulfanilamide had been instituted. Of considerable importance were the clinical observations in 10 of these patients. Within twenty-four hours after sulfanilamide therapy, organisms permanently disappeared from stained smears of urethral exudates. However, urethral discharges persisted for several days longer before disappearing. These patients were probably kept under observation longer than was necessary before declaring them cured, but we were apprehensive about starting prostatic massages too soon.

Of the remaining 10 patients, 7 could not be classified as cured because they stopped coming to the clinic before three successive prostatic massages could be done. When last seen, however, all were without urethral discharge or genitourinary symptoms. In this connection, it may be added that we experienced considerable difficulty in convincing many of our patients to continue attending the clinic after they had received sulfanilamide for a few days. Their genitourinary signs and symptoms were reduced almost to a minimum, and they saw no reason to return.

The 3 remaining patients were classified as definite therapeutic failures. Although the drug was administered for over three weeks, they had a persistent urethral discharge, with gonococci present in stained smears. After two to three days of treatment, the organisms disappeared from the urethral discharge for from two to eleven days, after which they again became evident. The possibility that the strains of these individuals were refractive to sulfanilamide is discussed below.

Of the 8 patients who had received treatment for their infections before appearing at the clinic, 6 had been given anterior urethral irrigations with potassium permanganate, without apparent effect. Following sulfanilamide therapy, 3 were classified as cures, 2 as doubtful and 1 as a failure. Another patient had been given a gonococcal vaccine subcutaneously and prostatic massages, without improvement. His infection cleared up with sulfanilamide medication. One patient had taken some unknown capsules by mouth without relief, and responded well to sulfanilamide.

Although no serious side effects were noted as a result of the drug, several of the patients felt uncomfortable. The commonest symptoms were headache, dizziness and nausea. Eleven patients

with gonococcal infection, since the action of bacteriolytics has been shown to be a major mechanism in rendering the blood stream free of organisms. For this reason, sulfanilamide should be a useful adjunct in treating patients with all types of gonococcal infection. It should be emphasized, however, that while a high bacteriolytic titer is an expression of humoral immunity, it cannot be correlated closely with local immunity. In this regard, Spink and Keefer¹¹ have shown that while the blood stream may be rendered free of gonococci by the introduction of immune horse serum organisms may still be present in prostatic secretions. This fact was also illustrated in the present study by the 3 patients classified as failures. The bactericidal power of the blood was elevated while sulfanilamide was being administered, but the urethral exudates persistently contained gonococci. It may be argued from these cases that although the bactericidal tests done against two strains of gonococci showed the drug to be effective, the actual strain harbored by the patient would not be affected by sulfanilamide. We answered this, in part, by bactericidal tests with the patients' blood, to which small amounts of sulfanilamide and suspensions of the patients' own organisms were added. Under these circumstances the blood killed the organisms in large numbers.

Attention should be called to the systemic reactions that patients have as a result of taking sulfanilamide. Although our patients experienced no serious results, a potential danger lurks in the indiscriminate use of this drug. Unfavorable reactions may be prevented by observing the patient closely while he is under treatment.

SUMMARY

1 Twenty-one men with acute gonococcal urethritis were treated with sulfanilamide. Eleven of the patients were declared cured from four to seven weeks after treatment was instituted. Seven

patients were classified as doubtful, while 3 were refractive to treatment.

2. The dose of sulfanilamide was 4 gm daily in divided doses for from ten days to three weeks. Side effects of the drug included nausea, headache, dizziness, cyanosis, fever and diarrhea.

3. Immune studies on the blood indicated that sulfanilamide does not affect the gonococcal complement-fixation test or serological tests for syphilis.

4. Sulfanilamide increased the bactericidal powers of the patients' bloods against two strains of gonococci. This increase was demonstrated only while the drug was being administered. Since this mechanism is important in clearing the blood stream of organisms, sulfanilamide should be a useful adjunct in the treatment of local gonococcal infections.

We are indebted to Miss Marjorie L. Jewell and Miss Eleanor M. Fleming for technical assistance.

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clinic for seventeen days, and a test showed the titer approximately that of a normal control. It should be noted that although his blood had a high bacteriolytic titer, gonococci were persistently dem-

due to a number of variable factors not clear at present.

From the foregoing experimental observations, it has been shown that the administration of

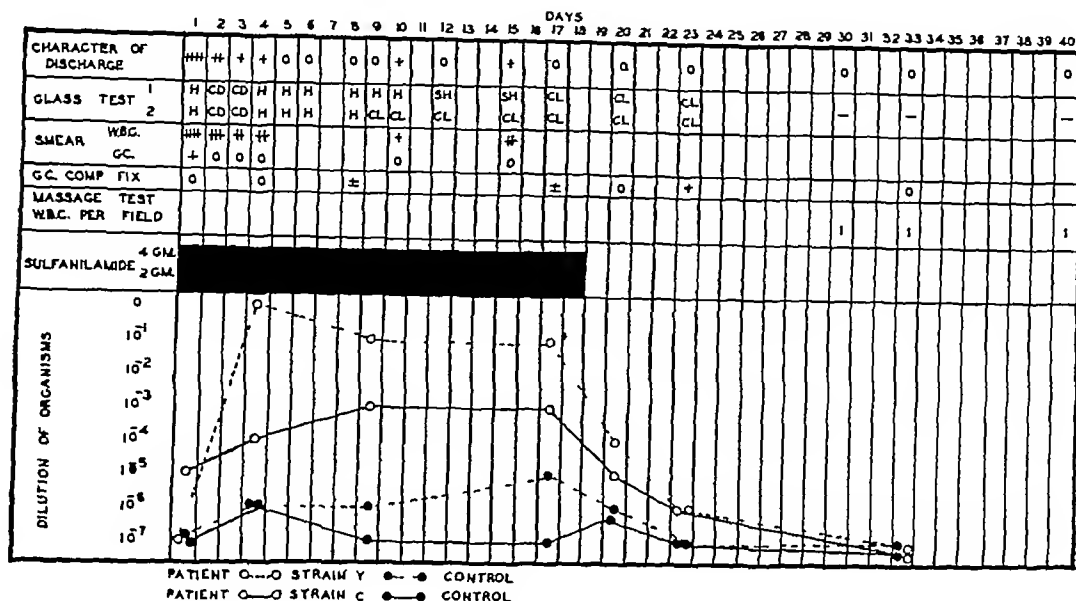


Chart 2 The patient received 4 gm. of sulfanilamide for eighteen days with clinical improvement. The chart shows the rise in the bactericidal power of the patient's whole blood while the drug was being received with decrease after it was discontinued.

onstrated in the urethral discharge. This observation is commented upon below.

We endeavored to ascertain the dose of sulfanilamide that would result in a marked rise in the bacteriolytic titer. It was found on several occasions that 4 gm. a day maintained a high bacteriolytic level, but when the dose was reduced to 2 gm. a day the bactericidal power of the blood was considerably reduced. It became evident during our observations that the optimum dose for maintaining a high bacteriolytic titer was 4 gm. daily. This fact is of considerable importance in treating patients where the organisms have invaded the blood stream.

DISCUSSION

Our clinical observations appear to confirm the reports of Dees and Colston⁸ and Reuter⁹ that sulfanilamide is effective in the treatment of some patients with gonococcal urethritis. Of the 21 patients studied, 11 were probably cured, 7 had no urethral discharge but could not be proved as free from infection, and 3 failed to respond to treatment. The ultimate outcome of these patients will depend upon a continued follow-up study. While our clinical results are not so satisfactory as those reported by others, this may be

sulfanilamide results in an increase of the bactericidal power of the blood against the gonococcus. A high bacteriolytic titer is desirable in patients

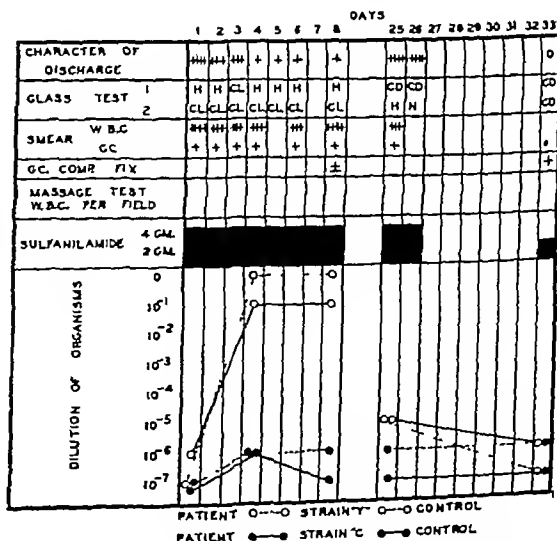


Chart 3 The patient received 4 gm. of sulfanilamide for eight days, with only slight clinical improvement, but marked increase in the bactericidal power of the whole blood. The drug was discontinued for seventeen days, and the bactericidal power was found to be the same as the normal control.

blood-sugar level was normal. The urine remained normal, likewise the leukocyte count of the blood. The temperature was almost constant at 104 to 105°F, with a pulse rate of 130 to 150. Blood cultures were negative.

The purulent discharge from the thigh wound gradually diminished, and swelling and redness subsided, the diminution in local reaction being in contrast with the sustained pyrexia. The stuporous state continued but the patient gradually became somewhat more responsive

There are some changes to be seen in gross, such as an intense congestion of the meninges and diffuse pinkish-purple discoloration of the gray matter, which did not seem to be due altogether to the congestion. No gross hemorrhages are present. In material that has been fixed in 10 per cent formalin and sectioned, there is a well-defined and pale grayish zone from 1 to 2 mm. in diameter in the deep layers of the cortical gray matter. It is found in practically all parts of the cerebral cortex of both hemi-



Figure 1 Low power photograph of the tip of a gyrus in the anoxic area. In the deep layers of the gray matter (laminæ 5 and 6) bordering the white matter is seen a dark streak. This is the principal lesion and here nerve cells are destroyed and replaced by glial and mesodermal nuclei which are present in excessive numbers (Nissl stain 10X) Kindness of Dr C S Kubik

to painful stimuli and at times uttered a few random words. The depression of tendon reflexes, absence of plantar response and general flaccidity remained unchanged. Two blood transfusions served to increase the hemoglobin, but produced no other noticeable beneficial effect. On the 12th day after the last operation signs of pneumonia became evident, and next day the patient died without ever having regained consciousness.

Autopsy. The postmortem examination was unrestricted. The distal half of the right femur, including the epiphysis, was extensively infected. The epiphysis was separated, the periosteal proliferation was marked. The knee joint had become involved, but no undrained pus could be found. Bronchopneumonia of the right upper and lower lobes was present. The findings in the brain and spinal cord were studied by Dr Charles S. Kubik* and were described as follows:

This description² was published in the *New England Journal of Medicine* under Case Records of the Massachusetts General Hospital (No 18352). It is the first published account of such a lesion and is repeated here because it has been lost in the context in which it first appeared.

spheres. Well-defined lesions of the basal ganglia are not apparent to the naked eye.

On microscopic examination, the vessels of the pia arachnoid are congested. The subarachnoid space contains numerous red blood cells and a few endothelial cells. In the deep layers of the cortical gray matter and in the corpus striatum and the optic thalamus there are circumscribed lesions characterized by destruction of myelin, proliferation of glial elements and intense proliferation of blood vessels. Axis cylinders passing through the lesion are preserved but damaged. Ganglion cells are diminished in number, and those that remain exhibit degenerative changes.

In the cerebral cortex the lesion consists of a more or less continuous well-defined zone up to 2 mm. in width with a smooth inner and irregular outer margin, situated in the deep layers of the gray matter, the inner margin corresponding to the junction of the white and gray matter. Within the lesion practically all myelin is destroyed. There is extensive proliferation of microglia, with numer-

CEREBRAL ASPHYXIA DURING NITROUS-OXIDE AND OXYGEN ANESTHESIA

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BOSTON

A HAZARD of general anesthesia which is specially marked in the use of nitrous-oxide and oxygen mixtures is cerebral hypoxemia. Such lack of oxygen may be followed immediately by death, or recovery may be partial or complete. The case to be described is presented, as one in which hypoxemia during nitrous-oxide and oxygen anesthesia and surgical operation was at least partly responsible for the development of unusual neuropsychiatric manifestations and peculiarly localized degenerative lesions in the brain. The case is of interest not only as illustrating a hazard of anesthesia, but because of its bearing on problems of physiology and neuropathology. The cases reported by Courville¹ and Lowenberg, Waggoner and Zbinden² are of similar importance.

CASE REPORT

The patient, B P (M G H. No. 320093), a 12 year-old American schoolgirl, entered the hospital complaining of pain and swelling in the region of the right knee. Her previous health had been excellent, and no serious illness was noted in the past history. Two weeks before admission the patient had fallen downstairs and injured her right knee, and 4 days later pain, swelling and redness appeared just above the knee. Her temperature became moderately elevated, and the family doctor prescribed bed rest and ice packs on the knee.

On admission there were the signs of moderate reaction to infection in a generally well-nourished and well-developed girl. Examination of the chest and abdomen showed no abnormality. The lower half of the right thigh was diffusely swollen, reddened and exquisitely tender, the signs being most marked in the popliteal space and over the lateral aspect of the femur. X-ray films showed separation of the lower femoral epiphysis with erosion of the epiphyseal surfaces. The rectal temperature was 102.2°F, the pulse rate 120, and the leukocyte count 14,500. The urine was normal. A diagnosis of osteomyelitis of the lower end of the femur with separation of the epiphysis was made.

Operation was performed under nitrous-oxide and oxygen anesthesia. The anesthesia lasted 40 minutes and was well taken, the patient's color being good throughout. A large abscess beneath the muscles lateral to the lower half of the femur was drained, and the metaphysis was drilled in several places. Following operation the leg and thigh were splinted and gentle skin traction was applied. Pus from the abscess contained *Staphylococcus aureus* in pure culture.

Fever continued after operation, and on the 5th day counter-drainage through the popliteal space was established. Nitrous-oxide and oxygen anesthesia was again used, and lasted 45 minutes without cyanosis.

During the following week there was only slight evidence of improvement, and low grade fever and leukocytosis continued. A mild anemia was demonstrated, the erythrocyte count being 3,600,000 and the hemoglobin 75 per cent (Tallqvist). X-ray films showed increasing destruction of the metaphysis and lower diaphysis of the femur, in view of which, together with general evidence of persistent infection, it was decided to lay open the bone more thoroughly.

In the third operation, 11 days after the first, nitrous-oxide and oxygen anesthesia was again used. A window was made by cutting away the cortex laterally in the lower end of the femur to drain the medulla. No tourniquet was used. Anesthesia lasted 42 minutes and proceeded without mishap, except that the anesthetist had difficulty in maintaining regular and even respiration, so that several times the blood in the wound was notably dark. As the dressing was being applied at the conclusion of the operation the anesthetist reported that the patient had stopped breathing. When examined she was deeply cyanotic, although the air passages seemed clear. The pulse was full and strong, the rate 140. The heartbeat was very strong, and the neck veins distended. The anal sphincters were relaxed. Artificial respiration was started instantly, and with administration of 95 per cent oxygen and 5 per cent carbon dioxide the patient's color changed to a healthy pink. After 2 minutes, evidence of returning respiratory activity appeared in the form of a slight gasp. The gasps slowly became more frequent, and at one time there was a single, feeble attempt to vomit. The pupils at first were widely dilated, but as the patient's color improved they contracted. The pulse rate continued around 140, the blood pressure was evenly maintained at 130/70. At the end of 30 minutes, artificial respiration, which was very effective by reason of the flexibility of the chest wall, could be safely discontinued. By this time breathing was regular and even, but there were no signs of returning consciousness.

Soon after being returned to the ward the patient began to exhibit aimless waving, choreiform movements of the arms, facial grimaces, with rolling of the eyes upward and outward, and alternate periods of excitation and quiet relaxation. At times the excitation and coarse thrashing movements of the arms coincided with a burst of increased respiratory activity, the breathing being deeper as well as faster. There was incontinence of urine and feces, and no sign of perception of surroundings was displayed. Large doses of sedatives were ineffective in keeping the patient quiet. After 48 hours of maniacal delirium, excitement gave place to stupor, which was marked by flaccidity of muscles of the trunk and extremities, absent tendon reflexes, insensibility to painful stimuli and incontinence. Only feeble efforts at swallowing could be provoked by inserting liquids into the patient's mouth. Respiration was somewhat irregular, rapid and shallow.

Lumbar punctures, done twice with an interval of 3 days between, showed slightly increased initial pressure—285 mm. of water the first time and 240 mm. the second, the patient being relaxed. The chemical findings in the fluid were normal, as was the cytology of the fluid. The

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in the case here reported and in those of Courville¹ and Lowenberg et al.² However, the question of specificity of effect is again raised, and despite experimental work of Haggard,⁸ Haldane⁹ and Ford,¹⁰ we are unable to say beyond doubt whether the destruction of cells in the deeper layers of the cortex and in the basal ganglia is due to carbon monoxide, to other toxins in illuminating gas and automobile exhaust gas or to cerebral oxygen lack.

Gildea and Cobb,¹¹ in a study of the lesions and symptoms produced in animals, by temporary cerebral anemia found that focal areas of necrosis were consistently demonstrable in the cortex of cats surviving at least twenty-four hours. "Areas of devastation" were frequently present in the third and fourth laminae and occasionally extended into the fifth. These workers stated, however, that no one type of lesions could be said to be pathognomonic of cerebral anemia. Various neuromuscular disturbances, abnormalities of behavior and definite loss of intelligence followed the damage to the cortical cells in many animals. G. N. Stewart and his co-workers¹² produced cerebral hypoxemia in dogs by interrupting the cerebral circulation for periods of from three to eighty-one minutes under artificial respiration. In animals making only a partial recovery, disturbances of locomotion, paralysis, loss of sight and hearing and loss of general intelligence were noted.

The evidence presented by the present case of nitrous-oxide asphyxia and those of Courville and Lowenberg et al. may be taken with the reported cases of poisoning from illuminating gas and automobile exhaust gas, and the experimental data on cerebral anemia in animals, as suggesting that the common factor, cerebral hypoxemia, may result in destruction of cortical cells and survival of more resistant tissues, with consequent loss of intelligence and various disturbances at lower levels.

SUMMARY AND CONCLUSIONS

A case is reported in which apnea occurred during nitrous-oxide and oxygen anesthesia, causing widespread destruction of the nerve cells of the cerebrum. Neurologic symptoms appeared within an hour and lasted about forty-eight hours, when coma supervened. Death from pneumonia occurred on the thirteenth postoperative day. A review of the literature shows that this is not a rare sequence of events. Autopsy showed changes in the cerebral nerve cells similar to those found after experimental cerebral hypoxemia, and to those described in other cases of asphyxial death after nitrous-oxide and oxygen anesthesia and poisoning from illuminating gas and automobile exhaust gas.

Cyanosis and respiratory difficulty during nitrous-oxide and oxygen anesthesia may be a precursor of immediate cerebral damage. Death may follow several days or weeks later.

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ous granular corpuscles containing fatty material and particles of myelin. Many large mitotic cells are observed. Glial cells with large clear nuclei and well stained ameboid cell bodies, probably astrocytes, also appear to be increased in number. While axis cylinders appear to be practically undiminished in number, many of them are swollen or have a beaded appearance, and most of them exhibit some degree of alteration. Ganglion cells within the lesion are diminished in number. Most of those that remain appear

neuropsychiatric manifestations followed asphyxia from nitrous-oxide and oxygen anesthesia, and describes 13 new cases, 9 with fatal outcome. Lowenberg, Waggoner and Zbinden² report 4 cases of a similar nature. In both reports the authors point out that the widespread irregular destruction of cortex and basal ganglia, such as that shown in the



Figure 2 Myelin sheath stain of the same lesion as that shown in Figure 1. Here the picture is reversed: the white matter looks black and the lesion looks light because of lack of myelinated nerve fibers, which can be seen both above and below it. (Spielmeier stain, 40 \times). Kindness of Dr. C. S. Kubik.

to be severely damaged, some are very pale, somewhat shrunken or swollen and vacuolated and have pale nuclei, others are shrunken, more deeply stained, and have small, deeply stained nuclei. Neurophagia is not observed. Outside the zone of severe degeneration ganglion cells are not normal, they are pale, no Nissl bodies are observed, and the cytoplasm has a homogeneous finely granular appearance. Some of them have shrunken, somewhat distorted and eccentric nuclei, which, however, have well defined nuclear membranes and are not deeply stained.

"There is congestion of the cortical blood vessels. In the zone of degeneration the capillaries are greatly increased in number and there is extensive proliferation of their cellular elements. No hemorrhages are observed.

Lesions of the nature described are found in sections of cortex taken from various parts of the brain, and essentially the same findings are present in the corpus striatum and the optic thalamus. They are not observed in tissues consisting purely of white matter, nor are they found in sections of the pons, the cerebellum, the dentate nucleus or the spinal cord.

COMMENT

In a detailed and comprehensive report Courville¹ discusses recorded cases in which unusual

present case and most of theirs, may conceivably represent either a specific toxic effect of nitrous oxide or the damage incident to oxygen lack in these sensitive tissues.

Many cases of varying degrees of poisoning from inhalation of automobile exhaust gas and illuminating gas have been reported in detail. Various neuropsychiatric sequelae, such as generalized hyper-tonus, choreiform movements, Parkinsonism, peripheral neuritis, deafness and blindness, acute psychoses and mental decline are recorded.^{4,5} The pathologic changes in the central nervous system include vascular thromboses and petechial hemorrhages, cellular degeneration, demyelination and glial proliferation. Many observers have noted the greater frequency of the lesions in the cortex and basal ganglia.^{4,6,7} The psychiatric and neurologic symptomatology in such surviving cases of partial recovery, as well as the type and localization of the cerebral lesion in cases of brief survival, bear a suggestive resemblance to the picture seen

The success obtained in this case has led to somewhat similar operations with patients who have sustained trauma, and in whom the addition of a

factorily useful thumb which appeared fairly normal (Fig 3)



Figure 2. Photograph showing the end result

flap would to some degree avoid the sacrifice of viable tissue. Such a case is that of a man who cut off his thumb through the distal interphalangeal joint but brought the tip with him. It was sewn back into place. A sufficient amount of tissue lived so that it was later possible, with a flap graft from the back of the digit, to reconstruct a satis-



Figure 3. Photograph showing the reconstructed thumb as compared with the uninjured one

412 Beacon Street.

PROGRESS IN THE STUDY OF CARDIOVASCULAR DISEASE IN 1936

SYLVESTER MCGINN, M.D.*

BOSTON

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IMMEDIATE FLAP GRAFTS FOLLOWING TRAUMA

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WHEN an individual is injured in an accident and is taken to a hospital or a doctor's office, the usual procedure is to repair the damage as speedily as possible, even if it means the sacrifice of some viable tissue in order to bring skin edges together. This is particularly true of injuries to fingers. Nearly all surgeons feel that if a finger is cut cleanly across they will have to remove some bone in order to get proper flaps for a traumatic amputation. On the other hand, if at the first dressing every bit of viable tissue is saved, it can be decided at a later date, when it is known just what tissues have survived, what type of plastic operation to perform in order to obtain the best result.

The following case is reported because it seems to be a new procedure. Nowhere in the literature or through conversation with other surgeons has the writer encountered a similar operation.

On August 19, 1932, shortly after midnight, a young woman was brought into the Cambridge Hospital after being seriously hurt in an automobile accident. Although she said that she had lost consciousness at the time of the accident, she was quite herself at the time of admission. Aside from minor contusions, abrasions and lacerated wounds, the most important injuries were apparently the loss of the distal phalanges of the index and middle fingers of the right hand. The patient was a nurse who was finishing her training, and realized that if her fingers were shortened it would be a great handicap to her in finishing her course and carrying on her profession. Each finger had been cut completely across vertically to its axis through the distal interphalangeal joint. The skin and subcuticular tissues were slightly retracted from the joint cartilage and bone.

The patient was told that two procedures were possible: one to shorten the fingers considerably and obtain satisfactory flaps to close the wounds, the other, an untried method, to attempt to save all the tissue and restore the fingers to nearly their normal length. Although the latter method meant her being hospitalized for a time, she chose it.

An operation was done under ether anesthesia. The hand and right thigh were prepared. Minute pieces of bone and cartilage at the end of each injured finger were removed, so that no sharp points were left. Two ribbons of skin were separated from the outer and upper side of the thigh. With them was taken a substantial layer of subcuticular fat. Both ends of the ribbons were left attached so as to maintain the best possible circulation. The hand was then everted with the palm up, and one strip of skin was sewed to each finger stump (Fig 1). The hand was then solidly strapped to the thigh with adhesive plaster, the arm was bound to the side of the body, and sterile dressings were applied.

The patient made a good ether recovery, and during the subsequent days, although fairly uncomfortable because she had to keep her arm in the same position, did not suffer much pain. On August 26, 7 days after the operation, the strips were cut on either side of each finger, leaving a thick tab of tissue attached to the ends of the fingers. In both cases the circulation was excellent, the tabs viable and the wounds clean. The fingers were dressed with boric ointment, and the wounds in the thigh were closed with interrupted silkworm gut sutures, leaving

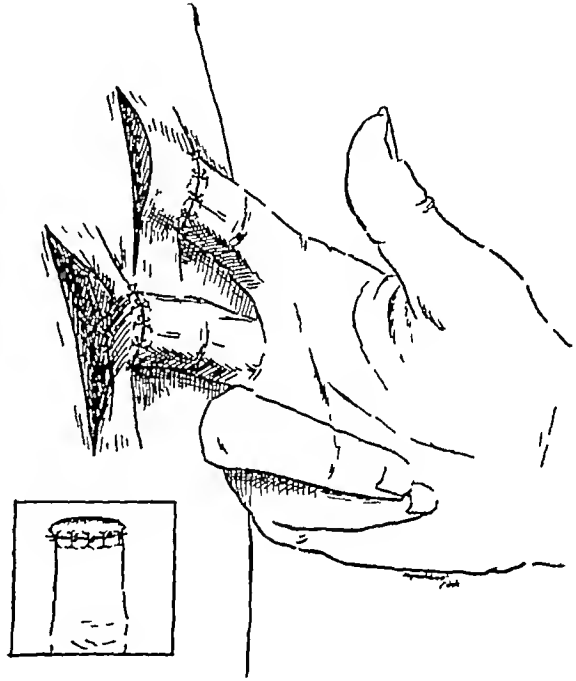


Figure 1 A diagrammatic drawing showing the patient's hand lying on the thigh with one strip wholly sewn and the other half attached to the injured fingers. The insert shows a finger after being cut away from the thigh.

two straight lines. The patient was then allowed to move about. As the fingers healed, they were strapped with sterile adhesive plaster so as to obtain the best possible shape.

On September 14, 4 weeks after the accident, the middle finger showed a small cleft near the tip. Lest this fold should interfere somewhat with function it was excised, using 1 per cent novocain as a local anesthetic, and the new skin edges were brought together. A week later both fingers were perfectly healed.

In October, the patient complained of having a growth of hair on the tips of the fingers. This hair soon wore off. Subsequently the patient returned to her work in a hospital, and has since had no trouble with the fingers. As the weeks passed into months, the new tabs gradually shrunk, leaving adequate non-tender coverings to the fingertips (Fig 2).

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The success obtained in this case has led to somewhat similar operations with patients who have sustained trauma, and in whom the addition of a

factorily useful thumb which appeared fairly normal (Fig 3)



Figure 2 Photograph showing the end result

flap would to some degree avoid the sacrifice of viable tissue. Such a case is that of a man who cut off his thumb through the distal interphalangeal joint but brought the tip with him. It was sewn back into place. A sufficient amount of tissue lived so that it was later possible, with a flap graft from the back of the digit, to reconstruct a satis-



Figure 3 Photograph showing the reconstructed thumb as compared with the uninjured one

412 Beacon Street.

PROGRESS IN THE STUDY OF CARDIOVASCULAR DISEASE IN 1936

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ly discusses the diagnosis, prognosis and treatment of heart disease

Herrmann presents a concise text on the cardiovascular system, also designed for practitioners and students, entitled *Synopsis of Diseases of the Heart and Arteries*. It is well written and amply illustrated. One third of the book is devoted to methods of examination, and the remainder to a discussion of the diagnosis and treatment of the various cardiac disorders. The final chapter concerns diseases of the peripheral vascular system.

Lutembacher, the well-known French clinician, correlates clinical studies and interpretations with anatomical findings of the heart in his book *Les Lésions Organiques du Cœur. Étude clinique, anatomique et thérapeutique*. There are many photographs of pathological specimens, which are described in the text.

Levy has edited a work entitled *Diseases of the Coronary Arteries and Cardiac Pain*. His collaborators include some of the foremost men interested in the circulation. It deals with all aspects of the coronary circulation and coronary heart disease. The book embodies our present knowledge of this subject, and shows the extent to which we have gone in treating it.

Abbott, in the *Atlas of Congenital Heart Disease* summarizes her vast experience over years of painstaking observation of congenital defects of the heart. This is the most complete and most up-to-date work on the subject, it is based on 1000 cases. There are many illustrations. Part I comprises a description of the development and comparative anatomy of the heart. Part II consists of a clinical classification of congenital heart disease arranged by groups, acyanotic, cyanotic tardive and cyanotic.

The Clinical Use of Digitalis has been produced by Luten. It presents a complete discussion of the valuable drug digitalis. Sixty-four pages are devoted to dosage and methods of administration.

Gradually data are being assembled that give us a definite picture of the geographic distribution of heart disease. It is of the greatest importance that such information be available to those investigating the etiology of various diseases of the cardiovascular system, so that they may be able to recognize the environmental factors most favorable or most unfavorable to a particular disease. It is of interest to note the occurrence of cardiac disease in New Zealand, as observed by Robertson in a survey of 700 consecutive patients with heart disease. The incidence of the various etiologic factors in 90 per cent of the cases was as follows: arteriosclerosis 32 per cent, cardiac neurosis 21 per cent, hypertension 14 per cent, rheumatic fever 14 per cent and thyrotoxicosis 12 per cent.

Geiger and his associates studied 3535 cardiac

cases representing a cross-section of the population of San Francisco. In 1933 the standardized death rate from heart disease per 100,000 population was 271.26. The degenerative diseases and arteriosclerotic hypertensive heart disease comprised 46.4 per cent of the total cases, rheumatic heart disease 22.2 per cent, syphilis 7.2 per cent, and congenital heart disease 5.5 per cent.

PHYSIOLOGY

Fineberg and Wiggers report their important experiments on dogs, in which they observed the reaction of the right ventricle to increasing gradual compression of the pulmonary artery. The aortic pressures and right intraventricular pressures were simultaneously recorded with optical manometers. With compression of the pulmonary artery up to 58 per cent, changes within the right ventricle are sufficient to overcome the pulmonary resistance, so that the blood supply to the left ventricle is unimpaired and the arterial pressure is but little affected. With increased pulmonary compression, however, the continued stretch of the right ventricle leads to beginning failure, especially with diminished coronary flow subsequent to a lowered arterial pressure. These authors feel certain that circulatory failure after obstruction of the pulmonary artery is due solely to fatigue of the right ventricle. Clinically, they believe, in such cases arterial pressure must be maintained so as to provide adequate coronary circulation to the failing ventricle. This implies that drugs directed toward lowering the pressure, as well as venesection, may be harmful and should be avoided. Lead 2 of the electrocardiogram was made on the dogs, and showed failure of the sinus mechanism, which was replaced by A-V nodal rhythm, followed either by cardiac asystole or ventricular fibrillation.

Dieckhoff in two papers discusses the capacity for work of the hearts of normal cats and of those with artificially produced aortic insufficiency, with and without hypertrophy. The capacity was tested first by increasing arterial pressure, secondly, by increasing cardiac output through raising the venous pressure, and thirdly, by noting the duration of life of the heart-lung preparation. The hearts with recently injured aortic valves and without hypertrophy showed by all three tests diminished capacity for work as compared with the normal or hypertrophied hearts. When a rubber valve was substituted for the damaged aortic valve, it was found that the recently damaged hearts compared favorably with the normal ones, but that the hypertrophied hearts continued to function longer than did the normal ones, this indicated the pronounced capacity for work when hypertrophy is present. It was found that digitalization before

injury to the aortic valve resulted in a greater ability to work than was shown by the undigitalized animals, although it was less in cats with normal hearts. Digitoxin and strophanthin were injected into the same types of hearts, both in the intact animal and in the heart-lung preparation. It was found that the lethal dose was diminished by 22 to 47 per cent when hypertrophy occurred.

The blood flow in the circumflex branch of the left coronary arteries in dogs has been studied by Essex and his associates with the *Thermostromuhr* of Rein. Epinephrine caused a transient increase in coronary blood flow four times that of control values, with nitroglycerin or amyl nitrite the flow was doubled for a short time. After injection of thyroxin the increase of flow was 244 per cent over the control value, and the increase persisted for forty-eight to ninety-six hours after injection. No significant correlation between coronary flow and heart weight or pulse rate was observed.

Brouha, Cannon and Dill studied the heart rates of totally sympathectomized dogs. The cardiac rate at rest was less than normal, and after exercise the acceleration was 30 to 40 per cent below normal. The dogs' capacity for work was not diminished. It was thought that cardiac acceleration in dogs after sympathectomy was due to lessened tonicity of the cardioinhibitors of the vagi and to an increase in the tonicity of the vagal cardioaccelerators.

Bradshaw reports his observations of the fall in blood pressure in 5 healthy and 4 completely sympathectomized cats. In the latter group the blood pressure fell very little after the spinal injection of procain, but in the healthy animals the fall was considerable. It was attributed to paralysis of the vasoconstrictor nerve fibers, especially those below the fifth thoracic level.

Barsoum and Smirk found in cases of congestive failure that there is an increase in the concentration of histamine-yielding substances in whole blood, entirely due to greater concentration within the red cells. Concentrations of these substances in the plasma and serum transudates, such as ascites and edema fluids, are equal and are within normal limits. In view of this fact the authors think that the presence of an excess of histamine-yielding substances in the whole blood does not explain an increased permeability of the capillaries in congestive failure.

PATHOLOGY

Gross and Fried examined the Tawara node and bundle of His of hearts from 110 patients, 60 of whom had active rheumatic fever, 25 inactive rheumatic fever, and 25 nonrheumatic conditions. Inflammatory and vascular changes were found in 66

per cent of the active cases, even though complete serial sections were not examined. The inactive cases showed few changes. Very few of the lesions seen were of a specific or highly characteristic nature.

Gross and Friedberg studied the cardiac valve rings of 40 nonrheumatic and 97 rheumatic hearts. The valve rings were selected for study because of the common belief that inflammation spreads from them to the valves and surrounding tissue. Normal rings rarely showed capillaries or inflammatory cells, but the valve rings of the rheumatic group showed extensive changes consisting of infiltration of inflammatory cells, vascularization, edema and scarring. Usually all rings were affected, but the pulmonic ring was the one oftenest free of change.

These men also studied a group of cases which at postmortem examination showed indeterminate terminal, or thrombotic, endocarditis. They believe that nonbacterial thrombotic endocarditis is an accidental occurrence in the course of a fatal disease, has no clinical significance, and probably develops on previously damaged valves. In two subsequent papers in collaboration with Friedberg and Wallack, Gross discussed two groups of nonbacterial endocarditis as found in acute thrombocytopenic purpura and in cases with prolonged fever, arthritis, inflammation of serous membranes, and widespread vascular lesions.

Thompson and White found 704 cases of right ventricular hypertrophy among 2000 consecutive autopsies wherein the wall was greater than 5 mm in thickness. In nearly 25 per cent of the cases no cause for strain on either ventricle was found. In 61 per cent of the remaining cases the strain on the heart had been due to hypertension, aortic-valve disease or infarcts in the left ventricle, and no cause for primary strain on the right ventricle could be discovered. Right ventricular hypertrophy was found in pure cases of left ventricular strain, with or without clinical evidence of failure, but when congestive failure was present the degree of right ventricular hypertrophy was greater.

Parkinson chose as his subject for the Lumsden Lecture of 1936 in London a discussion of our present knowledge of the size of the heart and the factors influencing it.

Andrus studied the structure of the small arteries and arterioles of the pectoral muscles of hypertensive and nonhypertensive patients. In the former group, it was noted that the fibrosis of the media of the small arteries and arterioles was somewhat more pronounced than that of nonhypertensive patients. Not all hypertensive patients, however, showed marked fibrosis. Prior to the twenty-ninth year no such cases were seen, but

they were encountered with increasing frequency after that age

Peery reports 5 cases found at autopsy to have dissecting aneurysms which were unrecognized before death. All the cases were those of Negroes, varying from twenty-two to forty-six years in age, 3 of whom had recognized hypertension. One had cardiovascular syphilis. One patient lived for about fifteen months after the clinical episode assumed to represent the rupture of the aorta.

ETIOLOGY

Congenital

The subject of congenital heart disease is reviewed by McGinn and White. They find the incidence to be about 1 per cent in 7500 autopsies. Their statistics indicate that the correct diagnosis is being made much more frequently in recent years than ever before. Ten of the congenital lesions that could be accurately diagnosed are discussed, with co-ordination of symptoms and signs of roentgenographic and electrocardiographic evidence.

Yater describes a very interesting but uncommon condition of congenital origin known as Chiari's network. It consists of a reticulum of coarse or fine fibers attached to the interatrial septum at one end and to the eustachian and thebesian valves in the right auricle at the other end. Its clinical importance is paradoxical in that emboli originating in the periphery may become enmeshed in its fibers and so held in the right auricle, where they may become broken into smaller particles. On the other hand, thrombi may form within the meshes themselves and be a source of pulmonary emboli. In Yater's case, an embolus 11.5 cm long, probably originating in a femoral thrombosis, was caught in the mesh of Chiari's network, from which point small emboli caused pulmonary infarction. The right auricle and ventricle were hypertrophied. Chiari's network causes no symptoms or signs, but should be considered as a possibility when multiple pulmonary emboli are encountered.

Taussig reports an interesting congenital defect of the heart in which the right ventricle failed to function, as a result of which the tricuspid and pulmonary valves became atresic. The escape of blood took place through the interauricular septum. If a competent patency exists, the heart functions as a two-chambered organ, otherwise as a three-chambered one—as biloculate or triloculate. Pulsation of the liver edge is easily felt when the septum between the auricles is intact and this aids one in determining whether the heart is functioning as a triloculate or biloculate organ. Clinically, persistent cyanosis and absence of murmurs are found in the anomalous case in

which the right ventricle fails to function. The electrocardiogram shows left-axis deviation, and the x-ray shows a concavity of the left heart border due to the absence of the pulmonary conus.

Arkin describes 6 cases, 2 with autopsy, of congenital heart disease characterized by a persistent right aortic arch and a rudimentary left aortic arch. The aorta in these cases passes upward to the right of the sternum and crosses to the left behind the trachea and the esophagus. The x-ray in the anterior view gives evidence of the aorta to the right of the sternum and absence of the usual aortic knob on the left. In the oblique or lateral view, the barium-filled esophagus is displaced forward as it passes over the transverse portion of the aorta.

Kissin found in the literature 154 cases of pulmonary valves with a supernumerary cusp, or four cusps, 3 of which were known to have shown pulmonary regurgitation. He reports a case with evidence of pulmonary regurgitation which showed enlargement of the pulmonary conus.

Subacute Bacterial Endocarditis

Segal reviews the literature in order to determine the incidence of the cardiac arrhythmias in bacterial endocarditis, in addition to reviewing a series of 192 cases of bacterial endocarditis, 67 of which had electrocardiograms. He found 4 cases of auricular fibrillation in that series, 2 of auricular flutter, and 12 of various types of heart block.

Rheumatic Heart Disease

Werner studied 100 cases of rheumatic heart disease with heart failure, 75 necropsies of the same condition and 50 cases of cardiovascular syphilis. Evidence of active rheumatic infection was demonstrated in 45 per cent of the clinical cases, and was suspected in an additional 21 per cent. Activity of the infectious process was found in 66 per cent of the necropsy specimens.

Coburn finds that the antistreptolysin curves of rheumatic fever differed from those of other streptococcal infections. The difference lies in the delay of the immune response in rheumatic fever and the delay in the elimination of products of hemolytic streptococci, as indicated by the persistence of high antistreptolysin titer levels for months after the infection. Coburn observed that the sedimentation rate is most rapid early in the course of acute rheumatic fever. The titer of antibody to hemolytic streptococcus does not attain its maximal level until the symptoms are regressing. This relation persists whether or not the acute attack was the initial one and whether or not it was a recrudescence. When there is no antistreptolysin response the patient is found to be free of symptoms and the sedimentation rate is normal.

Further evidence that an elevated sedimentation

rate is a measure of the extent of rheumatic activity is noted by Coburn and Kapp. It is believed to be due to an increase in plasma fibrinogen and globulin.

Sendroy and Schultz describe improvements in the urinary excretion test for ascorbic acid on a quantitative basis. Through digestive disturbances, rheumatic fever patients may develop a hypovitaminosis, with possible depletion of ascorbic acid and other vitamins, even though on an adequate diet. It is thought that ascorbic acid deficiency is a result and not the cause of the rheumatic infection. In a further clinical study, Schultz compared two groups of rheumatic children, one of which had received daily doses of ascorbic acid. In the treated group, subclinical scurvy was avoided, as determined by tests of capillary permeability. Neither the incidence nor the clinical course of acute rheumatic fever was demonstrably affected by the administration of ascorbic acid orally or intravenously. Schultz concluded that the deficiency of ascorbic acid was not a necessary factor in the etiology of rheumatic fever.

Rinehart, in a symposium on rheumatic fever, states that guinea pigs develop heart and joint lesions comparable to those of rheumatic fever when they have had a deficiency of vitamin C and an infection has been present. In the experimental work, no sharp line could be drawn between the picture of rheumatic fever and that of rheumatoid arthritis. Knowledge of the metabolism of vitamin C is far from complete, but it may eventually help to explain the etiology of rheumatic disease.

Dawson and Tyson comment on the relation between rheumatic fever and rheumatoid arthritis, and suggest that one may be a continuation of the other, the phase depending on age or on susceptibility of the host. Pathological evidence suggests that the two conditions represent different responses to the same or similar etiologic agent, whatever it may be. Even though *Streptococcus hemolyticus* is thought to play a role in the production of both diseases, the evidence is far from being complete, and even then it will probably be insufficient to explain the relation.

Angina Pectoris

Experimental evidence has been reported by Jackson and Jackson to support their theory that our concept of angina pectoris as due to coronary artery spasm is erroneous. Electrical stimulation at various parts of the esophagus resulted in pain similar in distribution to that of angina pectoris. They believe that angina pectoris is the result of spasmodic contractions of the esophagus and stomach, so that gas and materials contained with-

in these organs exert pressure on the walls of the viscera, causing strain and injury.

Bullrich employed cobra venom because of its analgesic properties in the treatment of 10 patients with angina pectoris. It was given intravenously every other day until the cessation of symptoms permitted its less frequent use. In all cases, pain was decreased and the capacity for work was increased.

Coronary Disease and Coronary Thrombosis

Johnston studied the incidence of coronary sclerosis in Negroes and Whites in North Carolina. In 400 autopsies the incidence of marked coronary sclerosis for white males was 24 per cent, for colored males 9 per cent, for white females 10 per cent, and for colored females 4 per cent.

Willius examined 370 cases of coronary thrombosis, 72 per cent of which occurred between fifty and seventy years of age. The ratio of men to women was 7:1, with cardiac death rates of 50 and 63 per cent respectively. Over half the patients died of cardiac deaths, and 45.7 per cent of them were reported as living. Of the cardiac deaths, 36.6 per cent were due to coronary thrombosis, 51.9 per cent to gradual myocardial failure and 11.5 per cent to an undetermined cause. The cardiac death rate increased progressively with recurrent attacks: 47.5 per cent with solitary occlusions, 69.8 per cent with two occlusions, and 75 per cent with three occlusions. Of the surviving patients 42.6 per cent reported themselves in good health, 23.1 per cent as well with restricted activity, 28.9 per cent as with recurrent anginal attacks, 3.6 per cent as with congestive failure, and 1.8 per cent as having suffered cerebrovascular accidents.

Two hundred and forty-three patients suffering from 267 attacks of coronary thrombosis are reported by Master, Jaffe and Dack. All were treated solely by bed rest and a low-calorie diet. The mortality rate was 16.5 per cent, in 8 per cent the fatal attack was the first. The ratio of women to men was 1:3, and most of the patients had an associated hypertension or diabetes, with occlusions occurring not infrequently in the fourth and fifth decades.

A study of 242 patients whose coronary arteries were found at postmortem to be sclerotic was made by Polanco. About two thirds of the patients were males. Cardiac pain had been present in 14.9 per cent, all of whom had moderate to marked sclerosis. In no cases with mild sclerosis was there a history of pain. The ratio of heart weight to body weight was increased in about 90 per cent of the cases.

Of 45 cases of Adams-Stokes' syndrome,

Schwartz reports 15 that followed an acute coronary occlusion. Of these, 7 lived for an average of twenty-six months with alternating transient or complete auriculoventricular dissociation, and 4 were reported as living with normal sinus rhythm. Four patients died within four days, the rhythm returning to normal in 2 cases. The treatment of such patients should include shock therapy, intramuscular injections of adrenalin and the daily administration of ephedrine sulfate. The results in these cases warranted the use of adrenalin despite the presence of coronary disease.

A case of thromboangitis obliterans is reported by Saphir in which the patient, a man of thirty-five, died suddenly. Autopsy revealed severe thromboangitis obliterans and arteriosclerosis of the coronary arteries, with small myocardial infarcts.

Levy and Bruenn report 24 cases in which there was sudden death and no fresh thrombus was found in the coronary vessels. They term this condition "acute, fatal coronary insufficiency."

A low-calorie diet (800 calories) was fed to 28 patients with coronary thrombosis and to 14 patients with angina pectoris by Master and his associates. In 31 patients the metabolism dropped from 15 to 35 per cent, in 6 from 10 to 14 per cent, and in 5 less than 10 per cent. The associated weight loss averaged 6 per cent of the initial weight. It required two to four weeks for the metabolism to drop, and an equal time for it to be re-established with a normal diet. No ill-effects from the low metabolism were observed in three to twelve months of undernutrition. Master believes that the low basal metabolism has a beneficial effect on the cardiovascular system, and that often the symptoms of heart disease are alleviated.

Cardiovascular Syphilis

In a series of papers on cardiovascular syphilis Cole and Usilton first consider syphilitic aortitis. They found 326 cases of uncomplicated syphilitic aortitis, representing 4.9 per cent of their total admissions for latent syphilis. The Wassermann reaction was positive in 72 per cent and the spinal fluid was abnormal in 49 per cent. Of patients adequately treated after the discovery of syphilitic aortitis, 63 per cent were living and free of symptoms, as compared with 49 per cent of those inadequately treated. Better results were noted when small doses of arsenicals were administered.

In their second paper, Cole and Usilton analyzed 260 cases of cardiovascular syphilis, 69 per cent of which had had no previous therapy. The incidence was three times as great in negro men as it was in white men, and was found to occur most frequently twenty to thirty years after the initial infection. The Wassermann test was positive in 85 per cent

and 62 per cent of the spinal fluid studies showed abnormalities. The use of adequate amounts of both arsenicals and heavy metals was found beneficial to patients with syphilitic aortic regurgitation.

Seventy-four cases of aneurysm were studied by Cole and Usilton. One third of these showed involvement of the central nervous system. Seventy-seven per cent of the patients had had no previous treatment. The Wassermann reaction was positive in 90 per cent of the cases, and 64 per cent of the spinal fluids examined were abnormal. Symptomatic relief was obtained in 56 per cent of the cases, the patients receiving more than thirteen arsenical injections, heavy metals being prescribed in the interim. The average duration of life after detection of the aneurysm, when adequate treatment was administered, was 75 months, 16 per cent of the cases being followed for eight years or more.

Hypertension

Schulze and Schwab give an interesting discussion of hypertension in the Negro. Essential hypertension is very rare in the African Negroes, whereas their descendants, the American Negroes, have two and a half times as much hypertensive heart disease as do the Whites. The incidence is one and a half times as great for women as for men. Schulze and Schwab attribute the apparent differences between African and American Negroes to the fact that the latter have tried to adopt the mode of life of their new-found civilization, but only with restraint and many tribulations. They deprecate the theory of the biologic inheritance of primary hypertension in view of this variation in the same race.

Following a study of 40 cases of heart failure in hypertension, Averbuck concludes that an associated coronary sclerosis or thrombosis is responsible in a great majority of cases (85 per cent). In a control group of 30 patients with hypertension, but dying of cerebral accidents or incidental disease and without congestive failure, only 10 per cent showed significant coronary disease.

Marañón and Domenech conclude from their studies of the blood pressure that it is not influenced by changes in the secretions of the hypophysis. Such variations as were noted were thought to be normal changes, implying a relation to increasing age. Hypertension associated with bromophilic adenoma of the hypophysis was believed to be secondary to hyperplastic changes in the suprarenal rather than in the hypophyseal gland.

Palmer reviewed 169 cases of hypertension in order to determine the success of medical measures, to discover what might be expected from surgical procedures, and to ascertain which types

were most apt to be benefited. Of patients under thirty-six years of age with variable systolic pressures up to 180 mm., 75 per cent will, he believes, have a normal pressure within ten years. Patients in later life with elevated systolic but nearly normal diastolic pressures, due to large-vessel sclerosis, are known to do well. With ample medical care, a substantial fall in systolic pressure occurs in one half of the mild and moderate and in one third of the severe cases of essential hypertension. Symptomatic relief is obtained in 90 per cent of the mild cases, 75 per cent of the moderate, and 46 per cent of the severe. Palmer believes that surgery may be indicated in certain patients of the mild or moderate groups and in young adults who show rapid progress of the hypertension. He hopes that splanchnic resection will give lasting symptomatic relief and halt the progress of the disease.

Hines and Brown devised a test consisting of recording blood pressure readings before and after immersion of a hand in ice water, so as to measure generalized vasomotor tonus. Observed responses are classified as normal, intermediate or abnormal. Ninety-eight per cent of the cases with essential hypertension had maximal abnormal reactions. Three cases of the intermediate or prehypertensive group developed hypertension. This suggests that the test may be useful in determining which cases may eventually develop essential hypertension.

Findlay describes several of the surgical procedures devised for the treatment of high blood pressure, and comments on the probable results in such operations.

Pulmonary Heart Disease

Oppenheimer and Hitzig studied the hemodynamics of pulmonary and myocardial insufficiency in chronic lung disease. Their investigation included measurement of the initial venous pressure, and that exerted during right upper-quadrant compression, arm-to-lung time, arm-to-tongue time and lung-to-tongue time. The circulatory measurements are normal in pulmonary insufficiency, owing to emphysema, and abnormalities indicate that the condition is complicated by myocardial failure. If the latter is present it may be due to failure of the right heart consequent upon the lung disease, or to left-heart failure resulting from a coexisting cardiovascular disease. Right-heart failure is characterized by high venous pressure, increased further by upper abdominal pressure, by prolongation of the arm-to-lung time and by an almost normal lung-to-tongue time. Left-heart failure shows a normal initial venous pressure, with or without a rise with right upper-quadrant compression, and an almost normal arm-to-lung

time. In bronchial asthma the measurements are normal, but in cardiac asthma there is a prolongation of the lung-to-tongue time. In chronic bronchopulmonary disease there seems to be no parallelism between the severity of the symptoms and retardation of the circulation through the lungs.

From their clinical and experimental study of emphysema, Kountz, Alexander and Prinzmetal have made these observations: (1) the heart is affected in most patients with emphysema, (2) cardiac hypertrophy with dilatation of the right ventricle may give symptoms in the late but not in the early stages, (3) coexisting left ventricular hypertrophy, in the absence of its obvious causes, is unexplained, and (4) from experimental work done on dogs, hypertrophy and dilatation seem to occur in the earlier stages of emphysema when the lungs are in the process of distention. In dogs with partial tracheal obstruction, the intrapleural pressure and peripheral venous pressure fall as the lungs distend. When complete distention is attained, intrapleural and finally venous pressures rise, resulting in less blood entering the heart and a consequent fall in right auricular pressure.

Darley and Doan report a case of primary pulmonary arteriosclerosis. It occurred in a twenty-year-old woman who had had symptoms of pulmonary obstruction since childhood. She had used enormous quantities of salt all her life. Autopsy showed pulmonary arteriolar sclerosis, dilatation of the pulmonary artery and right ventricular hypertrophy. No cause for pulmonary hypertension other than the pulmonary sclerosis could be found.

Steinberg and Mundy injected many small emboli into the pulmonary arterial system of a dog, and found that 79 per cent of the total lung by weight could be deprived of its arterial circulation without causing death. After two or three weeks, restoration of blood supply in the damaged lung tissue became apparent as canalization and newly branching arteries appeared. Bronchial arteries are seen to become dilated, and it is suggested that a collateral circulation from these prevents actual necrosis of the lung tissue. Langendorf and Pick report the electrocardiographic changes observed in 4 patients showing lung emboli at autopsy. Most of the changes resembled a posterior infarct.

Miscellaneous

Weiss and Wilkins describe cardiac disturbances resulting from vitamin-B deficiency. They have observed tachycardia, bradycardia, asystole and syncope, right- and left-sided heart failure and collapse. In the electrocardiogram, T-wave changes

Schwartz reports 15 that followed an acute coronary occlusion. Of these, 7 lived for an average of twenty-six months with alternating transient or complete auriculoventricular dissociation, and 4 were reported as living with normal sinus rhythm. Four patients died within four days, the rhythm returning to normal in 2 cases. The treatment of such patients should include shock therapy, intramuscular injections of adrenalin and the daily administration of ephedrine sulfate. The results in these cases warranted the use of adrenalin despite the presence of coronary disease.

A case of thromboangitis obliterans is reported by Saphir in which the patient, a man of thirty-five, died suddenly. Autopsy revealed severe thromboangitis obliterans and arteriosclerosis of the coronary arteries, with small myocardial infarcts.

Levy and Bruenn report 24 cases in which there was sudden death and no fresh thrombus was found in the coronary vessels. They term this condition "acute, fatal coronary insufficiency."

A low-calorie diet (800 calories) was fed to 28 patients with coronary thrombosis and to 14 patients with angina pectoris by Master and his associates. In 31 patients the metabolism dropped from 15 to 35 per cent, in 6 from 10 to 14 per cent, and in 5 less than 10 per cent. The associated weight loss averaged 6 per cent of the initial weight. It required two to four weeks for the metabolism to drop, and an equal time for it to be re-established with a normal diet. No ill-effects from the low metabolism were observed in three to twelve months of undernutrition. Master believes that the low basal metabolism has a beneficial effect on the cardiovascular system, and that often the symptoms of heart disease are alleviated.

Cardiovascular Syphilis

In a series of papers on cardiovascular syphilis Cole and Usilton first consider syphilitic aortitis. They found 326 cases of uncomplicated syphilitic aortitis, representing 4.9 per cent of their total admissions for latent syphilis. The Wassermann reaction was positive in 72 per cent and the spinal fluid was abnormal in 49 per cent. Of patients adequately treated after the discovery of syphilitic aortitis, 63 per cent were living and free of symptoms, as compared with 49 per cent of those inadequately treated. Better results were noted when small doses of arsenicals were administered.

In their second paper, Cole and Usilton analyzed 260 cases of cardiovascular syphilis, 69 per cent of which had had no previous therapy. The incidence was three times as great in negro men as it was in white men, and was found to occur most frequently twenty to thirty years after the initial infection. The Wassermann test was positive in 85 per cent

and 62 per cent of the spinal fluid studies showed abnormalities. The use of adequate amounts of both arsenicals and heavy metals was found beneficial to patients with syphilitic aortic regurgitation.

Seventy-four cases of aneurysm were studied by Cole and Usilton. One third of these showed involvement of the central nervous system. Seventy-seven per cent of the patients had had no previous treatment. The Wassermann reaction was positive in 90 per cent of the cases, and 64 per cent of the spinal fluids examined were abnormal. Symptomatic relief was obtained in 56 per cent of the cases, the patients receiving more than thirteen arsenical injections, heavy metals being prescribed in the interim. The average duration of life after detection of the aneurysm, when adequate treatment was administered, was 75 months, 16 per cent of the cases being followed for eight years or more.

Hypertension

Schulze and Schwab give an interesting discussion of hypertension in the Negro. Essential hypertension is very rare in the African Negroes, whereas their descendants, the American Negroes, have two and a half times as much hypertensive heart disease as do the Whites. The incidence is one and a half times as great for women as for men. Schulze and Schwab attribute the apparent differences between African and American Negroes to the fact that the latter have tried to adopt the mode of life of their new-found civilization, but only with restraint and many tribulations. They deprecate the theory of the biologic inheritance of primary hypertension in view of this variation in the same race.

Following a study of 40 cases of heart failure in hypertension, Averbuck concludes that an associated coronary sclerosis or thrombosis is responsible in a great majority of cases (85 per cent). In a control group of 30 patients with hypertension, but dying of cerebral accidents or incidental disease and without congestive failure, only 10 per cent showed significant coronary disease.

Marañón and Domenech conclude from their studies of the blood pressure that it is not influenced by changes in the secretions of the hypophysis. Such variations as were noted were thought to be normal changes, implying a relation to increasing age. Hypertension associated with basophilic adenoma of the hypophysis was believed to be secondary to hyperplastic changes in the suprarenal rather than in the hypophyseal gland.

Palmer reviewed 169 cases of hypertension in order to determine the success of medical measures, to discover what might be expected from surgical procedures, and to ascertain which types

still of the ventricles, then a progressive increase in the heart rate up to 160 beats per minute before restoration of the basic ventricular rhythm. He describes the clinical appearance of the patients during the changes.

Sappington and Cook believe that atherosclerosis of the radial artery is extremely rare and gives no true indication of visceral sclerosis. It had been thought that age changes and arteriosclerotic changes were maximal in the coronary arteries.

Morlock and Horton failed to find any constant increase in the blood pressures of patients with renal tumors, nor did any consistent variation in blood pressure result from their removal.

Wood studied the sedimentation rates of 164 cases of heart disease. He found sedimentation slow in cases of congestive heart failure and of congenital heart disease associated with cyanosis. It was rapid in cases of active rheumatic carditis, syphilitic aortitis, myocardial infarction, bacterial endocarditis, malignant hypertension and angina that came on during rest.

Shookhoff and his associates found that the sedimentation rate in cases of acute coronary occlusion might be abnormal even though the white count and temperature have returned to normal limits.

X-RAY

Schwedel and Epstein demonstrate and explain the appearance of the pulmonary artery in roentgenograms.

Marks describes a proved case of calcification of the annulus fibrosis of the mitral valve, correctly diagnosed by x-ray during life. It can be detected by fluoroscopy, the instrument being focused on the left auriculoventricular groove and being shifted inward and downward at an angle of forty-five degrees.

Kommerell describes 10 cases with calcified heart valves, and the technic employed to demonstrate them.

Yater explains his technic for injecting interarterially a radio-opaque material by means of which the arterial system can be studied, and cites cases to demonstrate the value of this procedure. The material injected is Thorotrast, a stabilized 25 per cent colloidal solution of thorium dioxide. Yater has had no unfavorable experience with this drug. Roentgenograms made immediately after its injection show peripheral arterial abnormalities such as obliterative endarteritis, thromboangitis obliterans, embolism and arteriovenous aneurysms.

ELECTROCARDIOGRAPHY

Fenichel and his associates report further studies of the RS-T segment of the electrocardiogram following their experiments on cats. They conclude

from their observations that the area of necrotic myocardium resulting from a coronary occlusion is electrically inert, or produces only an initial current of injury in the electrocardiogram. However, the necrotic area is surrounded by a transitional area of myocardium which although not destroyed has nevertheless been damaged owing to an insufficient blood supply. These investigators believe that this transitional zone of temporarily damaged muscle is responsible for the "coronary" type of T wave, because of a delay in the process of retreat from the contractile to the resting phase of the muscle. The T wave sometimes becomes upright after coronary thrombosis, as the process of healing goes on and an adequate blood supply restores the muscle immediately surrounding the necrotic area to good function.

Fenichel, Shookhoff and Abramson have published their experiments on cats' hearts. They stimulated various parts of the ventricles and thereby produced extrasystoles in the electrocardiogram. At the same sites they cauterized areas of the myocardium, causing displacements of the RS-T segments. It was found that the phase of the RS-T segment was consistently opposite the direction of the initial deflection of the extrasystoles caused by stimulation of the same area of myocardium.

Harris and Hussey studied the serial electrocardiograms of 50 dogs before and after ligation of the anterior descending branch of the left coronary artery. Changes in the R-T segment in most cases were noted within two hours of ligation. Arrhythmias were common, 15 dogs developing ventricular fibrillation immediately or within ten minutes after ligation. Eighteen cases showed normal rhythm for several hours, after which nodal and ventricular premature beats were observed preceding nodal or ventricular tachycardia, ventricular flutter, ventricular fibrillation and finally death.

Burnett and Taylor report on 1276 electrocardiograms of 85 healthy boys and 82 healthy girls, the data being obtained from series of periodic electrocardiograms begun at three or four weeks of age, these are to be continued to maturity. Right-axis deviation was found frequently in the first few months of life, decreasing in frequency between four and six months of age, P-R intervals and duration of the QRS complexes tended to be shorter in children than in adults.

Heard, Burkley, and Schaefer took standard and chest leads on 11 prematurely born infants. Tracings were made as soon as three and a half hours after delivery. For the most part the electrocardiograms were similar to those of adults.

Kossmann and his associates made a study of

have been noted. Normal or previously diseased hearts are affected by the lack of vitamin B, a condition which may be commoner than is supposed, especially among alcoholic patients. Therapeutic measures directed at providing vitamin B may give rapid or gradual improvement in the clinical symptoms.

Feil studied 38 cases of pellagra, all except 1 being associated with chronic alcoholism, of this group, 19 cases had changes in the electrocardiogram. Fourteen had no associated disease that might have influenced the tracing. The abnormalities noted were inversion of the T waves in either or both Leads 1 and 2, elevations of the S-T segment and high T waves. Lead 4 was abnormal in 12 cases, 4 of these having normal conventional leads. An electrocardiographic study of alcoholic patients without pellagra failed to show similar changes, and roentgenographic studies of the heart were normal. It is suggested that pellagra causes a physiologic cardiac disturbance inasmuch as pathological studies of 12 cases failed to show gross or microscopic cardiac abnormality.

Landt and Benjamin studied the hemodynamics and electrocardiograms throughout the course of the pregnancies of 19 women. It was found that pregnancy placed a definite burden on the cardiovascular system, but one normally within the bounds of physiologic compensation. Electrocardiographic changes, namely the presence of left-axis deviation, are due to a shifting of the position of the heart to a horizontal position.

Sprague emphasizes the necessity of distinguishing acute pericarditis with effusion from chronic constrictive pericarditis or Pick's disease. Tapping the pericardium gives prompt relief in the former condition, whereas surgery to remove the constricting pericardium is necessary in the latter. The rheumatic infection is a very uncommon cause of Pick's disease. The clinical syndrome of chronic constrictive pericarditis is similar to that of right ventricular failure, characterized by venous distention, liver engorgement, ascites and edema. Although dyspnea is common, orthopnea is rare. The size of the heart is usually normal and Broadbent's sign is rare. Electrocardiographic evidence is helpful in making the diagnosis.

Cushing reports 11 operated cases of chronic adhesive mediastinopericarditis. The electrocardiogram showed low voltage of the T waves and QRS complexes. In 4 of 7 cases the voltage increased after pericardectomy.

Menninger and Menninger present a group of interesting cases and a discussion of the psychic element in apparent cardiac disorders.

Yaskin discusses cardiac psychoses as disorders arising in the course of organic heart disease, and

cardiac neuroses as consisting of cardiac complaints without organic heart disease. In cardiac neuroses the complaints are related to the precordium or cardiac arrhythmias, and are only a part, even though the most prominent part, of a general neurosis due usually to an underlying anxiety.

Kirch reports his findings in the hearts of 9 athletes between fifteen and twenty-five years of age who were examined after sudden death. In 3 cases cardiac hypertrophy was present, no cause for it could be found other than athletic activities.

Gelman and Pusik report the cases of 2 men of Moscow, aged 112 and 122 years, who worked as farmers until the ages of 103 and 113, respectively. The former had hypertension, cardiac hypertrophy, a positive Kahn test and a normal electrocardiogram. The latter showed at postmortem a hypertrophied left ventricle and slight coronary sclerosis.

In cases of acute infection, Warfield believes that it is not the heart that fails, but that there is a peripheral collapse comparable to shock, so that the heart has no blood to pump. Just before death the heart dilates because of anoxemia. Digitalis is not helpful in peripheral collapse, and measures such as the giving of intravenous saline or dextrose to restore blood volume should be employed. Oxygen is indicated to combat anoxemia whenever cyanosis appears.

SYMPTOMS AND SIGNS

After studying the phonocardiograms of 120 normal infants two years of age and under, Segura reports finding three sounds per cardiac cycle in 38 per cent of the cases. He assumes that the third sound is due to auricular contraction because of its relation to the first sound, which it immediately precedes, and to the P wave of the electrocardiogram. No cases showed reduplication of either the first or second heart sound, or a physiologic third sound.

Although most cases with extrasystoles show no heart disease, Boas and Levy direct attention to premature beats that are of clinical significance. Such beats occurring during an infectious disease indicate myocardial damage due to toxicity. Auricular extrasystoles in the presence of heart disease may be the forerunners of auricular fibrillation. Extrasystoles in the presence of arteriosclerotic or coronary heart disease may indicate a progressive vascular lesion. They are frequently seen in association with attacks of angina pectoris. Extrasystoles originating from more than one focus are evidences of serious myocardial disease.

Schwartz observed attacks of transient ventricular fibrillation in 7 patients. He believes that the course of events following the fibrillation is as follows: a postfibrillatory pause, followed by a stand-

ducing the oxygen content of inspired air to 8 per cent in 13 normal individuals. He noted an increase in the cardiac rate, shortening of the P-R and QRS frequencies, increase of the P waves and flattening of the T waves. These changes disappeared on relieving the anoxemia. Oxygen given to 6 cyanotic patients gave electrocardiographic changes just opposite to those seen in the anoxic individuals.

Paschke found T-wave changes in the electrocardiograms of anemic rabbits following the administration of adrenalin. In normal rabbits adrenalin caused no change. He believed that the increased oxygen metabolism of the heart caused by the adrenalin in conjunction with the anemia resulted in a relative anoxemia of the heart muscle.

Kurtz and his associates studied 109 patients, taking electrocardiograms before operation, at intervals during operation and ten hours afterward. Various anesthetic agents exclusive of spinal anesthesia were employed. Only 21 per cent of the cases failed to show some type of disturbance. Arrhythmias were commonest, consisting of extrasystoles, displacement of the pacemaker, irregular ventricular action, complete heart block and paroxysmal auricular fibrillation. They also noted changes in the P-R interval and the S-T segment, and variations in amplitude of the QRS complexes and T waves, all of a transient nature.

PHARMACOLOGY

Nathanson, recognizing that structural changes in the heart are rarely sufficient to explain fatal cardiac syncope, has made a study of cardiac standstill and ventricular fibrillation, either of which may cause sudden death. The former was induced by reflex vagus stimulation and the latter by adrenalin. Drug therapy is useful in preventing these conditions, adrenalin serving to prevent cardiac standstill, and quinidine or acetyl-beta-methylcholine being useful to prevent ventricular fibrillation.

McGuire and Richards report the death of a normal thirty-one-year-old woman twelve hours after ingesting 300 gr of digitalis. Death occurred from respiratory failure. Electrocardiograms showed complete heart block, with an auricular rate of 170 and an idioventricular rate of 60 to 70.

Fifteen cases, 2 without and 13 with organic heart disease, are described by Tung. They illustrate the toxic effect of digitalis in causing auricular fibrillation. After the drug had been discontinued or reduced, a normal sinus rhythm was restored in from two to fifteen days.

Middleton and Chen present further evidence of the digitalis-like action of thevacin when given by mouth, based on a study of 40 cases of decompensa-

tion. The drug is thought to be useful in refractory cases or those intolerant to digitalis.

Strauss found that inorganic potassium iodide combined with silicic acid inhibited experimental adrenalin sclerosis in 60 per cent of the cases and cholesterol atherosclerosis in 70 per cent. Inorganic iodine alone had no effect.

Berliner offers experimental evidence of the possible effect of calcium on the normal human heart. An intravenous injection of 10 cc of a 20 per cent calcium gluconate solution gave electrocardiographic changes in 26 normal individuals. Bradycardia was present in 67 per cent, the P waves were flattened or inverted in 54 per cent, and the T waves were flattened or inverted in 92 per cent.

Sikl reports 2 cases examined post mortem following treatment with neosalvarsan. One patient was suspected of having syphilis, and the other was in the primary stage of that disease. A diffuse myocarditis, with an unusual eosinophilic infiltration, was found in both cases. Sikl believes that the condition was due not to syphilis but to an allergic reaction to the drug.

TREATMENT

Clark, Means and Sprague review the results of total ablation of the thyroid gland in 21 cardiac cases. Of these, 2 had angina pectoris, the remaining cases suffering from congestive heart failure. Fifteen patients are dead. It was felt by the authors that the operation had been worth while, judging from the results in 25 per cent of the cases. This series of treated cases is an early one, the operations being performed shortly after the procedure was introduced, and the cases selected were undoubtedly too seriously ill to expect good results. The writers believe that in selected cases of cardiac failure unamenable to medical measures, total thyroidectomy may give at least temporary benefit in about 50 per cent.

As a result of their experiments on dogs, in which they ligated the descending coronary arteries, Wiggers and Green came to the important conclusion that the drugs commonly used as vasodilators after coronary occlusion are in reality of little value in increasing the collateral flow to the ischemic myocardium. Theobromine and theophylline had an insignificant effect in their experiments and the nitrite group caused only a slight decrease in resistance to coronary flow in the ischemic area. The benefits of the latter effect were minimized by the lessened pressure in the larger collateral vessels. Adrenalin increased the resistance to the inflow of blood to the ischemic parts.

In experimental animals, Smith and his associates point out, preparations of theophylline have a marked dilating effect on the coronary arteries.

the Q waves in electrocardiograms of 178 normal adults. The records were made in the sitting and recumbent positions and in full inspiration and expiration. Q waves were found in Lead 1 in 40 per cent of the cases, in Lead 2 or 3 in 60 per cent, and in Leads 2 and 3 in 40 per cent.

Weiss and McGuire report 2 interesting cases of auricular tachycardia, the first of forty-three years' duration and the other probably of ten years' duration. Neither patient showed evidence of cardiac failure as a result of the tachycardia.

Orgain, Wolf and White found that paroxysms of auricular flutter and of auricular fibrillation occur not infrequently in persons without other evidence of cardiac disease. In a follow-up study of 54 cases (47 with auricular fibrillation, 5 with auricular flutter and 2 with both), they found but little important cardiac disease and a low mortality rate. They conclude that the prognosis for life in such cases and for the maintenance of an adequate circulation is good, and that a decrease or cessation of paroxysms is quite possible. It is thought that these transient arrhythmias are functional and not indicative of organic heart disease.

Seventy-two cases of complete A-V dissociation have been reported by Graybiel and White. Two thirds of the patients were men, and nearly two thirds of the cases were due to coronary disease. The disease of the heart responsible for the block was more important in determining the clinical course than was the block itself. The prognosis of the cases due to coronary disease was usually poor. Dizziness, syncope or convulsions were present in 44 patients, the only drugs of value in their treatment were ephedrine and adrenalin.

Tung has presented 2 cases of functional bundle-branch block with short P-R intervals. Both patients were subject to attacks of supraventricular paroxysmal tachycardia, on the cessation of which the electrocardiograms showed right bundle-branch block, apparently the usual rhythm for these apparently normal individuals. Although atropine did not prolong the P-R interval, as sometimes happens, it did abolish the vagal tone and result in a normal electrocardiogram.

Kurtz reports 6 cases of transient bundle-branch block. All the patients were over fifty-four years of age, with coronary disease or hypertension present.

Battro and his associates studied a group of patients with bundle-branch block to determine whether the ventricles contracted synchronously. Of 19 patients with left bundle-branch block, in 17 the right ventricle contracted first and contraction in the left ventricle was delayed. In the remaining 2 cases the ventricles apparently con-

tracted simultaneously. In 3 cases of right bundle branch block, in only 1 did the left ventricle contract before the right, there being no asynchronism in the other 2 cases. It was concluded that the electrocardiogram was not completely satisfactory in establishing the diagnosis of bundle branch block. The investigators' method of study was to record optically the apex beat, venous pulse, central arterial pulse and heart sounds.

Rosenblum and Sampson report that in a study of the electrocardiograms of 50 normal children an upward T wave in Lead 4 was a normal finding. The T_4 was upright in 64 per cent of the cases, diphasic in 32 per cent and inverted in only 4 per cent. There was no relation to axis deviation. The ages of the children varied from one month to sixteen years.

Robinow and his co-workers found that the T wave in Lead 4 might be upright, diphasic or polyphasic in normal children. Children with active rheumatic heart disease show a higher percentage of upright T waves than do normal children, with the T wave tending to be inverted with recovery.

Edeiken, Wolferth and Wood believe that an upright T wave in Lead 4 in the case of an adult who has not received digitalis should make one very suspicious of heart disease, especially of disease of the coronary arteries, even when the conventional three leads show no abnormality.

Faulkner reported 51 cases of fresh cardiac infarction. Lead 4 showed the only electrocardiographic evidence of infarction at some time or other in 8 cases, and in 3 the conventional leads never suggested its presence. Of 13 cases of acute infarction checked by autopsy, the electrocardiographic evidence was positive in 11. Of 20 cases that did not have infarction the electrocardiogram was negative in 16 and questionable in 4.

Levine and Levine report an electrocardiographic study of Lead 4 based on 44 postmortem examinations. In 12 cases with an absent Q wave in Lead 4, myocardial infarction was found at autopsy, and about half of a group of 15 patients with small Q waves showed myocardial infarction. Upright T waves in Lead 4 were observed in the absence of significant heart disease. Evidence was presented to show that myocardial infarction is not uncommon in angina pectoris. Of 100 patients with this diagnosis, 16 failed to show a Q wave in Lead 4, and 11 of these had normal standard leads. Two cases, 1 with bundle-branch block and 1 with tuberculous pericarditis, showed no Q waves in Lead 4.

Tigges studied the effect on the electrocardiogram of placing 15 normal individuals in a chamber with an atmospheric pressure equivalent to that at 5000 or 7000 meters above sea level, and by re-

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They believe firmly that theophylline should be given in all cases of coronary disease.

Campbell and Gordon present a complete report of the treatment of 135 cases of auricular fibrillation with quinidine. This drug was successful in restoring normal rhythm in 64 per cent of the cases, and in 34 per cent it has been maintained for an average of four years. In 30 per cent of the cases auricular fibrillation recurred after an average period of two years. Twenty-five per cent of the cases treated between 1923 and 1928 still have normal rhythm after nine years, and 39 per cent of the cases treated between 1929 and 1934 have normal rhythm after two years. The authors believe that complete digitalization is important before starting quinidine. They stress the importance of the absence of congestive failure, of a greatly enlarged heart and of a long history of fibrillation. The presence of these factors in conjunction with valvular disease diminishes the likelihood of restoring or maintaining a normal rhythm.

Hoynes believes that diphtheria myocarditis can be prevented by the early use of 10 per cent glucose, injected intravenously.

With the growing popularity of the surgical treatment of hypertension by means of nerve resection, Allen, Lundy and Adson have devised a test which enables the examiner to predict the immediate effect that such a procedure will have on the blood pressure. They inject intravenously a solution of Pentothal Sodium to obtain a maximal temperature of the skin of the toes. The blood pressure following injection is proportionate to that which might be expected in the usual neurosurgical operation for hypertension.

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of a primary source of cancer other than in the right upper quadrant. As my last consideration,—and the one I feel explains the enlargement,—I again come back to infection. I do not believe it was liver abscess. She had had fairly long-standing jaundice and a backing-up of bile, so that an infection in the biliary tree might well explain the enlargement of the liver.

So far as the laboratory work is concerned the bile in the urine is what one would expect with jaundice. The rapid respirations of 44, in the absence of thoracic disease, are explained by the tenderness of the mass in the upper abdomen, with resulting involuntary splinting and limited excursion of the diaphragm. The temperature of 100° F and the pulse of 100 are difficult to evaluate as they apparently are single readings. We have no way of knowing if this woman was running a septic temperature with points along her chart in excess of 100° F. The one reading is certainly suggestive of an infectious factor in her disease. The white-cell count is very high, especially when we consider the fact that the temperature was only 100° F—she may have been dehydrated which would help to elevate it. The high white-cell count suggests either a gangrenous area with a disturbance of blood supply or a very extensive infection. If the jaundice were intrahepatic in origin, I do not know how to explain the mass which was felt below the liver and which I have stated I believe to be an enlarged gall bladder. This brings us back to obstruction of the common bile duct as a primary cause of the jaundice—to me, the obvious answer. With obstruction of the duct she might have had extrinsic pressure as a cause, but against this is the fact that the story is connected with definite episodes of pain, furthermore, the jaundice was not a steadily progressive one. If it were a primary lesion of the head of the pancreas I think the start of her story would have been different.

If the obstruction of the duct was not extrinsic it must have been intrinsic, and considering not only this one point but the whole story, the most likely explanation is that the woman had gallstones, with common-duct involvement. However, I believe there are definite arguments against gallstones as the primary explanation of the picture, and it is not my first choice as the cause of her obstruction. In the first place, she was too old for a typical gall-bladder story of, at the most, only a few years' duration. Secondly, as I read over the history I get the impression that the pain was not severe, although it radiated in the typical distribution of gall-bladder colic. If she had had inflammatory obstruction as a primary cause, I believe that she would have had more striking pain. The third point against gallstones' being the source

of the trouble is the fact that her difficulties started with anorexia and weakness as outstanding features. The pain is stressed less than anorexia and weakness, and as the story progresses it is the weakness that is emphasized. There may well be stones for they are commonly associated with cancer in the bile ducts, but they are not the primary cause of her trouble. The last argument against gallstones being responsible for the picture comes in a consideration of Courvoisier's law, according to which a gall bladder with cancer should be distended,—as I believe this one is,—whereas with stones it should not be palpable.

The other intrinsic cause of jaundice is cancer of the bile ducts, and I believe that that is the lesion here. I think that she had cancer of the common bile duct, probably around the ampulla, with an associated cholangitis and, because of the pain in the left upper quadrant, a certain degree of pancreatitis. As I have said, she probably will show gallstones as an incidental finding.

CLINICAL DIAGNOSIS

Acute cholecystitis

DR. FAXON'S DIAGNOSES

Carcinoma of the common bile duct with associated cholangitis and a certain degree of pancreatitis

Gallstones (incidental)

ANATOMICAL DIAGNOSIS

Primary carcinoma of the gall bladder

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY. There was no autopsy in this case so that I cannot answer all the questions that might be raised. However, a very careful exploration was done by Dr. Bartlett. The mass which was felt was an enormously enlarged gall bladder with a very thick, hard wall, it appeared obviously neoplastic. Nothing was felt in the bile ducts, and the head of the pancreas seemed negative. There was a little extension of the neoplasm from the gall-bladder area into the neighboring liver. There was no cirrhosis. A biopsy was taken of the gall-bladder wall which demonstrated adenocarcinoma on histologic examination. I think there is very little question that this was a primary carcinoma of the gall bladder.

A PHYSICIAN. Do you know what was inside the gall bladder?

DR. MALLORY. Unfortunately we do not. We have only the x-ray report from outside which showed "sand." I see no reason to doubt that it must have contained stones since carcinoma of the

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24181

PRESENTATION OF CASE

A seventy-five-year-old Italian housewife entered the hospital with the complaints of right upper-quadrant pain, anorexia and weakness of three and a half months' duration.

She had been subject to indigestion for a number of years but had no definite symptoms until about three and a half months before entry when she first began to have attacks of moderate right upper-quadrant pain which occasionally radiated through to her back and rarely could be felt in the right shoulder when she moved her arm. She had occasional attacks of nausea and vomiting and noticed gradually increasing anorexia and weakness. These symptoms progressed until one month before entry when she became so weak and anorexic that she remained in bed all the time. At the onset of the illness, x-rays of her stomach and gall bladder were taken which were said to show cholecystitis and "sand" in the gall bladder. During the month before entry she had several attacks of mild jaundice, and occasional light-colored stools and dark urine, she also complained of itching. During this time she had no appetite and lost about 30 lb in weight. During the two days before entry the pain radiated to the left upper quadrant and became somewhat more severe, although it was still not excessive. Her bowels were always regular, without catharsis. About a month before entry she had passed a black stool. She had had no hematemesis or melena and no cardiorespiratory or genitourinary symptoms, except for moderate dyspnea on exertion. Her menopause had occurred twenty years before entry, and there had been no subsequent bleeding or discharge.

Physical examination revealed a well-developed, somewhat obese, obviously ill, elderly woman, apparently suffering from severe abdominal pain. The skin was coarse, dry, atrophic and moderately jaundiced. The heart and lungs were negative, and the blood pressure was 142 systolic, 68 diastolic. In the right upper quadrant extending 5 to 7 cm below the costal margin there was a hard, rounded, smooth, tender mass which moved with respiration. The liver edge could be felt in the epigastrium 4 cm below the xiphoid. There was no ten-

derness elsewhere in the abdomen, no otl could be made out, and peristalsis wa The skin overlying the tumor mass v what edematous. Pelvic and rectal exa were negative.

The temperature was 100°F, the pulse respirations were 44.

The urine contained 2+ bile but was normal. The blood showed a white-cell 54,000.

A laparotomy was performed on th entry.

DIFFERENTIAL DIAGNOSIS

DR. HENRY H. FAXON. In summary w elderly obese woman with disease confin right upper quadrant. If she has les where I believe they are more or less i to the disease we are considering.

There are certain points and findings shall take up separately which seem to most important in the story. In the fu she had a large, hard, tender mass below edge which moved with respiration and i ciated with edema of the overlying skin consider what that might be. Taking likely things first, she might have some walled-off abscess, but there is no etio such, and since it moves readily with res it cannot be retroperitoneal. Furthermore patient as obese as she apparently was, very much if a retroperitoneal mass cou been felt with the distinctness stated in the. If it were a tumor mass in the gastroi tract, possibly the transverse colon, she shoi had certain gastrointestinal symptoms and x-ray studies. So we come to the gall b. a distended gall bladder with probable i because of the edematous overlying skin a derness—as the answer to this palpable mass which was felt below the liver.

The second fact that is noted and seem nent is the enlargement of the liver, whi easily felt 4 cm below the xiphoid. Th feeling of the liver edge at that level does necessity mean it is enlarged, because it have been pushed down from above, but, been, some abnormalities would have been in the region of the diaphragm. If pushed by a subphrenic abscess we should have to some etiology for that abscess. An enlarge in an elderly person might be of cardiac but if this were the case, there should have other signs of passive congestion. If it wei to metastases we should expect an irregular than a smooth mass. Furthermore, if met: it would be secondary to a source elsewhere so far as the history goes we have no good evi

DIFFERENTIAL DIAGNOSIS

DR. GEORGE A. MARKS One of the striking things about the patient is the fact that when she entered the hospital, after six months of more or less continuous pain and vomiting, she is described as a well-developed and nourished person in apparent good health, the history states that there had been no recent weight loss. Her history during the previous six months was that of upper abdominal pain with frequent vomiting. To go back to her previous attack, we know that the pain was described as midabdominal, whereas the pain described on entry was epigastric, radiating to the shoulder blades. We know that she had polyposis of the intestinal tract. I think the lower intestinal tract can be ruled out, so far as her symptomatology is concerned. The bleeding that she showed once by rectum can be explained on the basis of the polyps found in the rectum, which leaves us with a differential diagnosis centered in the upper abdomen, a decision has to be made as to where the primary disease was and how many of her symptoms can be attributed to one portion of her gastrointestinal tract. The pain is described as radiating from the epigastrium, first to one side and then to the other, and the conditions which could produce pain of that sort are gall-bladder disease, ulcer, occasionally, if it is penetrating, and, less probably, disease of the pancreas.

I have more or less ruled out disease of the pancreas because it seems to me that a patient in apparent good health probably could not have had a six-month story of pancreatic disease. The gall bladder tract must be considered, not only in view of the report of a positive Graham test demonstrating a gallstone, but because of the nature of the pain. The degree of vomiting is not particularly well explained on this basis, and it seems to me that it points toward obstruction at either the outlet of the stomach or the duodenum. Her vomiting apparently was quite constant with the attacks of pain. Therefore we must consider this condition which we know she has—polyposis of the intestinal tract—and try to decide whether all her symptoms can be explained on that basis. We probably can consider the history reliable. She did have a polyp or some sort of intestinal tumor which caused an intussusception. Polyps are certainly the commonest tumors producing intussusception. The family history also fits in with that diagnosis, since there was a hereditary tendency.

Where would a lesion of this sort have to be located to produce this pain? Since the stomach is negative by x-ray, the duodenum is the next place to look. She has a tumor which has been demonstrated in the duodenum. It might be a

pedunculated gastric polyp that had prolapsed through the pyloric ring, but it is more apt to arise from the duodenum itself and be of sufficient size to produce an intermittent obstruction. A tumor 3 cm in diameter would be large enough. It is evident that the tumor is not located in the second portion of the duodenum because there is no history of jaundice, unless we interpret the three-day attack of itching as a subclinical manifestation.

The question of gall-bladder disease has to be considered. She may well have had a coincidental cholecystitis and cholelithiasis. We might ask whether she had passed the stone, since the previous Graham test showed it, and the one done here did not. It is possible that the stone was passing or had just passed and had lodged in a diverticulum in the duodenum. These possibilities are a little far-fetched.

Then there is the question of whether this lesion in the duodenum was cancer. These polyps are prone to become malignant. Because of her general condition I feel that it was either not carcinomatous or still of a very low grade of malignancy. The fact that cancer of the duodenum usually runs a very rapid course of six, eight or nine months also makes it seem unlikely. If this had been cancer for the period of her present illness she would not have been in as good condition as she seemed to be on entry. So I leave my diagnosis as multiple polyposis of the intestinal tract, principally in the upper intestinal tract, I believe that the symptoms were caused by a large pedunculated lesion in the duodenum, which caused intermittent duodenal obstruction and probably was not malignant. Whether she has gall-bladder disease is a question.

DR. GEORGE W. HOLMES Here in a loop of the small bowel is a shadow which is obviously a polyp. From this area is a dense line which is at a right angle to the usual markings, suggesting intussusception. Here is another shadow in the duodenum which might be due to a polyp. There are several other suspicious areas. Here is a portion of the sigmoid, and it shows the rather characteristic appearance of polyp. The part of the examination which interests me most is the appearance of the duodenum. Here is a localized film of that area. It looks to me more like an ulcerative area than a straight polyp. I doubt very much if a polyp in the duodenum could produce that degree of deformity of the mucosal pattern. It could be polyp plus ulceration, or it could be ulcer alone.

PREOPERATIVE DIAGNOSIS

Polyposis of intestines

gall bladder almost never develops except in the presence of a stone

DR FAXON Was there any gangrene?

DR MALLORY There was no obvious gross necrosis, but white counts of this level are not uncommon in carcinoma victims

CASE 24182

PRESENTATION OF CASE

A thirty-three-year-old Sicilian housewife entered the hospital with the complaint of bilateral upper abdominal pain radiating to both shoulders

Two and a half years before entry, after a series of attacks of midabdominal and back pain, she developed acute intestinal obstruction with continuous vomiting for five hours. She was taken to another hospital where a laparotomy was done. Intussusception caused by a tumor of the intestine was found and relieved. Two months after the operation she had a miscarriage. After that she was free from abdominal pain until six months before entry when she began to have a heavy feeling in the pit of her stomach after eating, especially when she ate fried or fatty foods. This was frequently accompanied by nausea and vomiting of the food eaten. Occasionally she vomited small amounts of foamy material between meals. About three months before entry she began to have attacks of sharp persisting pain after eating which started below the ribs on the left, radiated to the left shoulder blade, then to the region below the right ribs and finally to the right shoulder. Her vomiting continued, occurring almost daily. About two months before entry she had an attack of shaking chills which lasted about an hour. Following this episode she had severe generalized itching without jaundice for a period of three days. Her stools were not clay colored, nor was her urine dark. One and a half months before entry she was studied in the other hospital where a Graham test showed a stone in her gall bladder. About one month before entry the attacks of radiating epigastric pain began to come on at night, without relation to meals. They were usually accompanied by vomiting. Two weeks before entry, after taking an enema, she passed a small amount of blood by rectum. She had no further melena and never any hematemesis, jaundice or diarrhea. Her appetite remained good, but she had been unable to eat much because of vomiting. For the few months before entry she had increasing constipation so that it was necessary for her to take milk of magnesia, mineral oil, and finally enemas as often as two or three times a week. She passed

large amounts of gas by rectum. Often she had to defecate, but on attempting to do so passed little or no feces. She had had recent weight loss.

Five years before entry she had had her appendix removed at another hospital. Her past history was otherwise noncontributory.

Her father died at the age of thirty-three following an appendectomy and two other abdominal operations. He had some sort of "stomach trouble," the exact nature of which the patient did not know. The surgeon who treated him at the time of his death said that he had "hole in his stomach or intestine." One month before patient's entry to this hospital her nine-year-old son died at another hospital of polyposis of intestine complicated by intussusception. The diagnosis was confirmed at autopsy. One of her brothers had a questionable history of polyp. There was no family history of cancer.

Physical examination revealed a well-developed and nourished woman in apparent good health. The heart and lungs were negative, and the blood pressure was 120 systolic, 70 diastolic. There was no spasm or tenderness of the abdomen. Both the right and the left colon were palpable, but there were no other masses. Rectal examination revealed two or three polyps easily palpable at the finger. Proctoscopy revealed three more, measuring about 1 cm in diameter and located 11 cm from the anus.

The temperature was 98.6°F, the pulse 90, and the respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,210,000 with 75 per cent hemoglobin, and a white-cell count of 53. The guaiac test on the stool was 2+. The blood Hinton test was negative.

A Graham test of the gall bladder was negative. Two barium enemas showed a pedunculated polyp measuring about 2.5 cm in diameter with a long pedicle located in the proximal sigmoid. No other polyps were demonstrated. Two gastrointestinal x-ray series showed a normal esophagus and stomach. The pylorus opened very slowly, and the duodenal cap did not fill completely although there was gross evidence of a lesion could be demonstrated in it. There was a definite tumor mass measuring 3 cm in length in the second portion of the duodenum. Hourly follow-up films of the small intestine showed polypoid defects in several loops, particularly in the upper part of the intestine. At times, one of the polyps in the upper jejunum seemed to be intussuscepted.

A laparotomy was performed on the twenty-first day.

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ANNUAL MEETING

THE Annual Meeting of the Massachusetts Medical Society will be held on May 31 and June 1 and 2 at the Hotel Bradford in Boston. Every effort has been made to make these three days unusual ones in interest, instruction and entertainment for members—and their wives—from all parts of the State.

An outstanding group of scientific exhibits has been arranged, each demonstration being under the supervision of experts in their particular field. Never before has there been so extensive a demand on the part of commercial exhibitors, and all the available space has been taken.

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NATIONAL HOSPITAL DAY

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Mother's Day has not, in our opinion, added any dignity or honor to motherhood. Perhaps, the chief contribution from this special day has been a few added jingles to the telegraph company's fifty-seven or more varieties of canned messages. Every day is, or should be, a sacred day for motherhood, and it seems quite possible that the emphasis on one day tends to give the thoughtless and selfish person more license to forget the deep significance of motherhood for the other three hundred and sixty-four days of the year. Some people's religion finds expression only on Easter, and we do not have much respect for that sort of religion.

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However, as the years have gone by, and we have noted the great numbers of people who have interested themselves, and been interested in this

DR MARK'S DIAGNOSES

Multiple polyposis of the intestinal tract Pedunculated polyp of the duodenum with intermittent obstruction

ANATOMICAL DIAGNOSIS

Adenomatous polyps

PATHOLOGICAL DISCUSSION

DR TRACY B MALLORY This patient was operated on by Dr Edward L Young because of the severity of the symptoms and the evident obstruction. He found multiple polyps including one in the duodenum which had caused intussusception. He resected seven separate polyps which were all more or less close to that region. He did not at-

tempt to do anything about the polyp in the large bowel and wound up his operative note by saying that the patient probably could not be cured by surgery but that it had been necessary to remove at least the one polyp that was causing the intussusception. Following operation she convalesced satisfactorily for a few days and then had one episode of very severe bleeding by rectum, unquestionably from the polyp in the cecum. After that she did better.

Dr Young examined the entire bowel as thoroughly as he could. No ulcer was noted in the duodenum, and nothing was found in the gall bladder.

DR HOLMES Was it a grape-like cluster of polyps?

DR MALLORY Yes

The New England Journal of Medicine

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THE NEW HAMPSHIRE MEDICAL SOCIETY
THE VERMONT STATE MEDICAL SOCIETY

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However, as the years have gone by, and we have noted the great numbers of people who have interested themselves, and been interested in this

day, we must frankly admit that our attitude has changed, and the change has come just because those who have promoted this cause have emphasized on this one day the permanent, or day-by-day, influence of the hospital as a great community blessing.

In the first place, National Hospital Day has promoted an unusual co-operation among hospital workers throughout the nation and Canada. The leading hospital authorities of the country have contributed to the plans and programs, and this has resulted in an unmeasured benefit to thousands of boards of trustees and administrators of institutions in the smaller communities, and it has stimulated not only knowledge and belief in the hospital, but has added real efficiency to the country's hospitals as a whole. This alone would justify the day.

But the real reason for organizing National Hospital Day was to give information and enthusiasm to the public about the progress of medicine and medical care in our hospitals. The public generally has been woefully ignorant of the real facts regarding medical care. After all, people do not have the same feelings about hospitals as they do about mothers and apples. Most people do not think of hospitals at all, unless compelled to, and then they usually think of them in terms of fear, or pain, or sorrow. When patients leave a hospital where they have been served well, they generally think of that hospital only in personal terms. They do not think of the great contribution of the hospital to the community as a whole.

National Hospital Day was conceived, in great part, to educate the public as to how the hospital serves as a bulwark against those diseases which menace the community. Just as a great reservoir is understood by the public to be a protection against the menace of fire, so should the hospital be considered as a great protective influence against community diseases. The activities surrounding this day have brought about that understanding. You cannot, even if on only one day a year, interest hundreds of thousands of people in visiting hospitals, in hearing factual and favorable speeches and radio addresses about them,

in reading news items and editorials explaining their work, without creating a favorable understanding and reaction.

In like manner, the general public has not understood the reasons for the high cost of medical care. Recently a friend of ours went to a local hospital, and complained, at first, of the eight dollars per day, plus extra charges, which he was paying for his stay. He said to us on our first visit, "These people are certainly not in this for their health." A few days before he left, however, the superintendent, knowing of his feeling about the costs of his care, took occasion to make a trip around the hospital with him. They visited the radium plant, where two grams of radium are housed. It was explained to him that this amount of radium, no larger than a small pea, cost the hospital \$140,000, and that the emanation plant, through which the healing gas is pumped off in small capsules to be used by the doctor, cost an additional \$10,000. He was taken to see a large 400,000-volt x-ray therapy machine, which cost over \$25,000. He saw a special solution room, where an average of fifty solutions a day are prepared for the surgeon to use for patients before and after operation. He saw enough of the hospital equipment to be aware of the tremendous costs of these necessary things. He visited the kitchens, where 868,160 meals are served each year, 70 per cent of them being special diets. He saw diabetic trays, on which every mouthful of food has to be weighed and measured for each individual patient. He visited the laundry, where 2,143,377 pieces of laundry, a matter of 615 tons, are handled a year. He was made aware of the special precautions that have to be taken regarding much of the hospital laundry. He visited the laboratories, the operating suites, and so forth. It changed his whole attitude. Instead of complaining of the high costs, he wondered how the hospital could do it for so little.

All this is what National Hospital Day hopes to do for the public in general, and what it has done to a very great extent. And that is why we believe National Hospital Day is a great national benefit.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS
AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 70 PREMATURE SEPARATION OF
THE PLACENTA

A twenty-four-year-old primipara, at term, but not in labor, was admitted to the hospital because of painless vaginal bleeding, amounting to 1 or 2 oz., which had occurred about fourteen hours previously.

Her family history was unimportant except that one sister had died of tuberculosis. There was no history of diabetes, cancer or hemorrhagic disease. Her past history had been negative, and her pregnancy normal.

Physical examination upon entry revealed a healthy, well-developed and nourished young woman, who was in no distress. Her heart and lungs were normal. The blood pressure was 120 systolic, 60 diastolic, and the pulse 80. The uterus was soft, and a normal fetal heart was heard. The pelvic measurements were those of a funnel type of pelvis. As the patient was not bleeding and not in labor, she was put to bed under observation. No rectal or vaginal examination was done. Two days after entry, under gas-oxygen anesthesia, the patient was examined vaginally to determine the source of bleeding. No placenta previa was felt, there was no cervical erosion or varicosities. Bright-red blood was found to be oozing from the internal os. The cervix was soft and patulous. The vertex was presenting with the head in the pelvis. The membranes were artificially ruptured to induce labor. Two and a half hours after this procedure, the patient went into labor, and four and a half hours later, when the cervix was fully dilated she was delivered by low forceps of a normal, 6 lb., 4 oz., female child in good condition. The forceps operation was performed because of fetal distress. There was no unusual bleeding during labor or after delivery.

The placenta revealed a very short (26 cm) cord, which was in all probability the cause of the fetal distress. There was no gross, old or recent hemorrhage on or in the maternal surface of the placenta. (However it is not always possible to demonstrate recent, intrapartum hemorrhage of the placenta, even in undoubted cases of premature

separation, such as placenta previa, when the bleeding is known to be due to separation of the placenta from its site of attachment.) Microscopically, the decidua showed cystic areas of degeneration with hemorrhage—a finding often associated with clinical and gross pathologic evidence of hemorrhage into and on basal decidua (premature separation of the placenta).

The patient ran an afebrile puerperal course, and she and her infant were discharged well on the fourteenth day.

Comment. Bleeding at term comes from some type of placenta previa, erosion of the cervix, varicose veins, a separation of a normally implanted placenta or more often from the separation of a low-attached placenta. There is no note in this case that preparations were made for bagging or for cesarean section when the examination showed the cause of bleeding. These precautions should be routine. The softness of the uterus and the presence of a normally functioning fetal heart ruled out an entirely separated placenta. The small amount of bleeding and the patient's pulse showed that the amount of intrauterine bleeding was slight. The examination vaginally ruled out any type of placenta previa, and also erosion of the cervix and vaginal or cervical varicosities, by a process of elimination the bleeding must have been coming from a placenta that had separated to a very small extent. The conservative method of rupturing the membranes to induce labor when the cervix is adaptable is the simplest method of treatment at hand. The facts that the patient started in labor so quickly and that the cervix dilated so rapidly are evidence that the patient was at term and that the cervix was well obliterated when the membranes were ruptured. While this patient's condition did not absolutely necessitate that the blood be typed and matched, it must be borne in mind that in most bleeding cases it is a piece of routine that should always be followed.

ERRATUM IN DIRECTORY

In the recently published *Directory* through a clerical error, the name of Dr. Morton H. Langill, of 36 Pleasant Street, Worcester, was omitted.

The name which should have been removed is that of Dr. William E. Langlois, of 25 Trowbridge Road, Worcester.

ALEXANDER S. BEGG, *Secretary*

LEGISLATIVE NOTES

House Bills 818 and 819, both relating to the commitment of insane persons, have been given leave to withdraw by the legislature.

A new bill, House Bill 1922, has been presented by the

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

Legislative Committee on Public Health This bill provides that certain bills that it has been studying, namely Senate 282 and House 759, 851, 852, 854 and 1409, be given to a recess commission, composed of its own committee, for further study

APPLICANT FOR FELLOWSHIP

SUFFOLK DISTRICT

Through a clerical error the following applicant was omitted from the list published in the *New England Journal of Medicine* of April 21 The applicant complied with the regulations in all respects

Sheehan, John F, 2537 Prairie Avenue, Chicago, Illinois
Georgetown University School of Medicine, 1933

ALEXANDER S BEGG, *Secretary*

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning May 9

BRISTOL SOUTH (Fall River Section)

Monday, May 9, at 4 30 p m, at the Union Hospital,
Fall River Subject Puerperal Sepsis Instructor
Benjamin Tenney, Jr Howard P Sawyer and
Robert H Goodwin, *Chairmen*

ESSEX NORTH

Friday, May 13, at 4 30 p m, at the Lawrence General Hospital, Lawrence Subject Puerperal Sepsis Instructor A Gordon Gauld John Parr,
Chairman

MIDDLESEX SOUTH

Wednesday, May 11, at 4 00 p m, at the Cambridge Municipal Hospital, Cambridge Street, Cambridge. Subject Acute Anterior Poliomyelitis—Its Diagnosis and Treatment. Instructor R Can non Eley Edmund H Robbins, *Chairman*

MENTAL HEALTH

Mental health has long been appreciated as a most desirable possession, and rightly so as mind is the controlling factor in all of our activities and endeavors Physical health, naturally, is also greatly to be desired It can exist without the former, and mental health can be present in a sick body, but in general, the state of each one has a direct effect on the other, for good or ill So, having the sound mind and the sound body together, leaves little else to be desired To try and separate mind from body or vice versa is a futile and undesirable procedure because it cannot be done So long as there is life, the two are inseparable, whatever affects one affects the other, to a greater or less extent It is a matter of common knowledge that physical illness has its effects on mental conditions, between the extremes of simple annoyance at being kept in bed by a common cold, to the wild delirium of some severe and toxic disease But our concern tonight is, rather, with the effects of the mind on the body and its functions The healthy mind helps the body to re-

spond in its most effective manner, without putting obstructions in the path of adequate response and behavior

In order to understand this, it is necessary to appreciate certain fundamental facts concerning the interrelation of mind and body Briefly, the latter is composed of the bony framework to which muscles are attached for the purpose of locomotion, and within which are various departments, each with its special organs and functions—such as the stomach and intestines for digestion, the lungs for breathing, and so on The apparatus that coordinates all the body functions into a workable, going concern is the nervous system This system, in brief, is made up of the brain and the nerves The former is the great central office into which messages are brought, and from which orders are issued to all parts of the body by means of the communicating wires, the nerves A part of this nervous system automatically controls the various physical functions without conscious intervention on our part, it has local centers, substations, below the level of our conscious awareness, thus making it possible for the higher centers to function on activities outside the body itself It is, however, definitely influenced by our conscious mental activities.

In order to react as a whole toward the constant changes within us and around us, we have mobilizing responses bringing the entire body into action toward specific ends—namely our emotions Fear mobilizes us to escape from danger, to make life safer, anger, to overcome obstructions, love, to find a mate and have children These primarily serve the demands of self Above these, we have intelligence which enables us to handle these mobilizing responses more effectively And, highest of all, we have the spiritual factor which demands that we live beyond self, that we put at least some of our energy—the more the better—to work for others, in spite of self interest It is in the conflict between this unself seeking factor and those that are self seeking that the greatest difficulties lie It is lack of understanding how to manage and resolve these conflicts that causes no end of unhappiness and mental and physical ill health It is characteristic of emotions that they want immediate release in action—I am scared, I want to run away now, not tomorrow It is a function of intelligence to delay that immediate reaction, if even for a fraction of a second, so as to help select the most effective manner of response, thus giving the spiritual factor its chance to influence the final action toward what is fairest and best, not for self alone but for others

Now when energy is released by emotional response, it must needs be put to some use, if that use is not directed outward, the energy turns in, so to speak, and the automatic body functions become overcharged and, therefore, are disturbed For instance, the irritable person, whether he be so from his own ill nature or from his unhappy situation, has habits of petulance, and the resultant excess of energy interferes with, say, his digestion and he is a chronic dyspeptic He generally attributes his irritability to bad digestion when, really, he is dyspeptic because he is irritable As children, most of us, in the face of some unpleasant demand, have advanced the excuse of being too tired or feeling sick, even to the point of becoming actively ill, thus trying to avoid the unpleasant task The great majority learn that this is not an effective way of meeting life, and grow away from it But, when things are not going our way, every one of us is capable of re turning to his childhood methods if he does not keep a good natured and honest eye on himself Just because we accumulate a few years and are, supposedly, 'old

enough to know better, does not guarantee that our emotions will always stay where they belong.

Because a person is mature in years, then, is not a reason in itself for having acquired complete and satisfactory emotional control. Ignorance and intolerance of this fact produce an obstructive attitude toward effective understanding, treatment and improvement in self-management. Overemotional, hypersensitive mental habits of response produce disorder of mental and physical function, a state commonly called 'neurotic.' This is illness just as much as a cold, pneumonia or a broken leg is illness, and ought to be handled in the same way by seeking competent help. It is only rarely wilful, and never imaginary. The disturbance in digestion, circulation or what not, produces distressing symptoms. One can imagine that these symptoms are caused by something disastrous, but the discomforts themselves are absolutely real. In such cases of nervous origin, examinations do not disclose any physical defect to explain the condition but the disorder will continue as long as the situation remains unsatisfying, or until the right attitudes are acquired. Obstructive prejudice against being thought neurotic—"just nervous"—prevents rational search for the cause hidden in the mental life, and the sufferer is an easy prey to quacks and charlatans, false sciences and pseudo-religious cults. Largely due to impressive suggestion and the promise of cure, the troubled mind is diverted and allows the body to carry on undisturbed by excess of emotion, producing apparent improvement. But only when the fundamental causes have been discovered, faced and readjusted can real and permanent improvement be effected. To acquire healthy minded attitudes,—and there has never been any greater need of this than today—training should begin in the cradle. Our first contacts with life are in our immediate families, making impressions upon us which may influence us throughout our lives. Therefore, it behooves every family circle to appreciate the importance of these first impressions, and later ones as well, and make the home a place where every possible influence is for stability. One of the best things about the family unit is that it presents a ready made, first hand opportunity for co-operative effort. However, when we attain adult, independent capacities, it is an error to believe that these impressions cannot be modified. If attitudes of mind making for healthy living have not been acquired at home, they can be acquired by one's own individual study and determination, by an honest evaluation of one's personal liabilities and assets.

It is gratifying to appreciate the fact that one does not have to be a superman to possess a healthy mind. The very humblest person can, and often does, reveal the desirable qualities of steadfast common sense, stability and courage that make for sound living. The great majority of persons, even in the face of very difficult conditions and limitations, can, with determined and intelligent effort, attain to effective and satisfactory mental health.

Q I am much interested in this important subject, and wonder if you can tell me one or two things more specifically. You speak of the mind affecting the body; could you not also say that, under certain circumstances, the mind has a bad effect on itself?

A Most decidedly—and an excellent point. For example, a too rigid or stubborn person, by persisting in thinking he is always right, may have perfect physical health, but his pugnacious inflexibility prevents normal friendly relations, and results, in the long run, in a querulous and unhappy mind. Or, again, many vigorous people make themselves unhappy by unnecessary fears, cross-

ing bridges before they come to them, being sorry for themselves, dramatizing minor limitations, brooding over hurt feelings—all of which are, primarily, indications of unhealthy attitudes interfering with the normal, useful activity of the mind. Yes, a great deal of maladjustment is due to the mind working against itself.

Q Why do so many people, and even some doctors, feel that nerves mean weakness of character, and even something to be ashamed of?

A Primarily, I believe, because of prejudice and not knowing the first thing about it—perhaps also annoyance at the particular difficulties attendant upon these disorders, and a mistaken belief that they are wilful. Also, this attitude can be an unconscious attempt to protect one's self against the discovery of one's own neurotic liabilities. It is well to remember that practically everyone who has normal intelligence, feelings and sensitiveness can, under a sufficiently aggravating combination of circumstances, get into nervous difficulties. So it is just as well to be understandingly tolerant.

Q You spoke of the necessity for self-examination and evaluating one's abilities, and so forth. Do not these tend to morbid interest in self, and even selfishness?

A No, not if it is approached in the right way. Of course, if it is an emotional, self-pitying process, it can lead to self-indulgent attitudes. But, if it is undertaken with a genuine desire for broader knowledge and for better methods of using one's capacities most effectively, it should, and does, enable one to get more away from self.

Q Am I right in thinking that mental health comes into the field of medical practice?

A Most decidedly yes. As medicine is concerned with all forms of human suffering, it is vitally concerned with the study, treatment and prevention of mental illness and, therefore, everything that makes for mental health.

Q If one wants help in sickness of this sort, how can one go about finding it?

A The family doctor can tell if the situation requires special care, and should be able to put you in touch with a competent specialist—just as he does in other conditions when they get beyond his field. All the best large hospitals have clinics devoted to this practice. Valuable information regarding lecture courses, books and pamphlets, and on occasion even personal advice, can be obtained from the Massachusetts Society for Mental Hygiene, at 3 Joy Street, Boston; this organization is very active in promoting a better understanding of things to do with mental health.

Q Can you suggest any rules that help to keep the mind healthy?

A Let us say suggestions, rather than rules. First, a good balance should be arrived at between work, rest and recreation, without over or underemphasis on any one of them; a hobby as well as a job helps here. Cultivate attitudes of tolerance, good nature, friendliness, and a wholesome, objective, militant optimism; reasonable care of and attention to the body—not abusing it with exaggerated care or with senseless high pressure and overstimulation of any sort. Keep the mind active in objective thinking but give it some opportunity for relaxing, constructive meditation. Encourage healthy religious beliefs, a confidence in something higher than and beyond self. And, finally, if the sentiment of pity is aroused, see to it that it is pity for others and not for one's self.

DEATHS

HOFFMAN—DONALD C. HOFFMAN, M.D., of New York City, died April 20. He was in his forty first year.

Born in Indiana, he was graduated from Depauw University and received his degree from the Harvard Medical School in 1926. Dr. Hoffman was at one time director of the clinical laboratory at the Boston City Hospital and for the last four years was a medical director for the Metropolitan Life Insurance Company in New York City. He spent some time in cancer research at the Rockefeller Institute.

Dr. Hoffman was a former fellow of the Massachusetts Medical Society.

His widow survives him.

MINOT—JAMES J. MINOT, M.D., died April 30, at his home, 188 Marlborough Street, Boston. He was in his eighty sixth year.

Born in Forest Hills, he attended Mr. Dixwell's School and Harvard University and received his degree from the Harvard Medical School in 1878. Upon his graduation he studied at Vienna, Berlin, Paris, Leipsig, London and other European cities. Dr. Minot was a physician at the Boston Dispensary, Carney Hospital and the Massachusetts General Hospital.

Best known for his work in the prevention and care of tuberculosis, he was one of the founders of the Boston Tuberculosis Association. He was president of the Massachusetts Emergency and Hygiene Society, fellow of the Massachusetts Medical Society, member, Boston Society for Medical Improvement, fellow, American Medical Association, member, American Association for the Advancement of Science, and a member of the overseers committee of the Harvard School of Public Health.

His wife died many years ago. He is survived by three sons and ten grandchildren.

MISCELLANY

NINTH ANNUAL CITY HEALTH CONTEST

The Chamber of Commerce of the United States recently announced the following awards for the 1937 City Health Conservation Contest.

Boston, Massachusetts, wins the first award in Group I (cities of over 500,000 population). Additional awards in this population group go to Cleveland, Ohio, and Pittsburgh, Pennsylvania.

In Group II (cities of from 250,000 to 500,000 population) Louisville, Kentucky, and Providence, Rhode Island, receive first awards, and an additional award goes to Dallas, Texas.

In Group III (cities of from 100,000 to 250,000) the winner is Hartford, Connecticut. Awards also go to Grand Rapids, Michigan, Yonkers, New York, Reading, Pennsylvania, Erie, Pennsylvania, Honolulu, Hawaii, Lynn, Massachusetts, Tacoma, Washington, and Knoxville, Tennessee.

In Group IV (cities of from 50,000 to 100,000 population) Sacramento, California, gets the first award and other awards go to Evanston, Illinois, Newton, Massachusetts, Greensboro, North Carolina, and Saginaw, Michigan.

In Group V (cities of from 20,000 to 50,000 population) Greenwich, Connecticut, is the winner, and Plainfield, New Jersey, Auburn, New York, Winona, Minnesota, Elmira, New York, Watertown, New York, Pittsfield,

Massachusetts, Maplewood, New Jersey, and Orange, New Jersey, are given awards of merit.

In Group VI (cities of less than 20,000 population) Englewood, New Jersey, is the winner, and awards go to Hibbing, Minnesota, Virginia, Minnesota, and Middletown, New York.

In addition to these prizes, special awards were given to Baltimore, Maryland, Brookline, Massachusetts, Detroit, Michigan, Hackensack, New Jersey, Newark, New Jersey, New Haven, Connecticut, Pasadena, California, Schenectady, New York, and Syracuse, New York. Each of these cities has twice or more won first awards in its respective population groups (and is therefore barred from the regular contest) and has during 1937 maintained its previous high standards of health protection services.

The City Health Contest is conducted annually by the Chamber of Commerce of the United States in co-operation with the American Public Health Association. Awards are given, in each of the six population groups, to those competing cities which, in the opinion of a committee of health experts, have during the past year dealt most effectively with their local health problems. These are *not* prizes for the healthiest cities, they are prizes for the most effective efforts to meet local health problems. Awards are not based on health department programs alone but rather on the community wide efforts of all agencies and groups including the work of private practitioners of medicine and dentistry.

RÉSUMÉ OF COMMUNICABLE DISEASES
IN MASSACHUSETTS FOR MARCH, 1938

DISEASES	MARCH 1938	MARCH 1937	FIVE YEAR AVERAGE
Anterior poliomyelitis	0	0	1
Chickenpox	1943	1471	1253
Diphtheria	17	12	42
Dog bite	788	762	608
German measles	92	105	1229
Gonorrhea	463	462	485
Lobar pneumonia	654	790	606
Measles	1258	3774	4212
Meningococcus meningitis	9	31	18
Mumps	1321	971	1144
Paratyphoid B	8	0	0
Scarlet fever	1712	1184	1335
Syphilis	635	657	489
Tuberculosis pulmonary	299	295	378
Tuberculosis other forms	41	9	42
Typhoid fever	3	0	1
Undulant fever	4	0	1
Whooping cough	572	2013	1259

*Based on figures for preceding five years

RARE DISEASES

Diphtheria was reported from Athol, 1, Boston, 1, Canton, 1, Lawrence, 1, Monson, 1, New Bedford, 1, Norwood, 1, Plymouth, 1, Salem, 3, Shirley, 1, Somerset, 1, Somerville, 1, Westboro, 2, Worcester, 1, total, 17.

Meningococcus meningitis was reported from Boston, 4, Holyoke, 1, Ludlow, 1, Melrose, 1, New Bedford, 1, Newton, 1, total, 9.

Paratyphoid B was reported from Boston, 1, Cambridge, 1, Reading, 6, total, 8.

Pfeiffer bacillus meningitis was reported from Brockton, 1.

Septic sore throat was reported from Athol, 1, Beverly, 2, Boston, 12, Everett, 1, Gardner, 3, Greenfield, 1, Lowell, 1, Lynn, 1, New Bedford, 1, Northfield, 1, Oxford, 1, Quincy, 1, Somerville, 1, Wrentham, 1, total, 28.

Trichinosis was reported from Boston, 4, Worcester, 1, total, 5.

Typhoid fever was reported from Boston, 1, Greenfield, 1, Randolph, 1, total, 3.

Undulant fever was reported from Fall River, 1, Gard-
ner, 1, Sunderland, 1, West Boylston, 1, total, 4

Chickenpox for the third consecutive month showed
record high figures.

The incidence of diphtheria was considerably below the
five year average.

Measles, German measles, whooping cough and pulmo-
nary tuberculosis were reported below the five year aver-
age.

Typhoid fever continued to show low incidence.
Lobar pneumonia, undulant fever and mumps were
reported above the five-year average.

Paratyphoid fever showed record high incidence.

The incidences of meningococcus meningitis and tuber-
culosis (other forms) were below the five year averages

Scarlet fever continued to be reported at a high figure.

The reported cases of animal rabies manifested a wider
distribution throughout the State. New foci were noted
in Canton and Montague. Previous foci in Uxbridge,
Westboro, Newton, Andover and Methuen were active.

CORRESPONDENCE

TUBERCULOUS SKIN LESIONS

To the Editor For many years I have read the "Cabot
Case Reports" with much profit. Two records that were
recently published in the *New England Journal of Medi-
cine* will be the subject of the remarks in this communi-
cation. These cases command interest, for they relate to
a field intermediary between internal medicine and der-
matology.

The first of these is Case 24111 (218 485-489, 1938).
This proved to be an instance of miliary tuberculosis ac-
companied by cutaneous lesions. The eruption was vari-
ously regarded as erythema nodosum or erythema indura-
tum. The occurrence of scars—even small, slightly de-
pressed ones—was in itself sufficient to eliminate the
former diagnosis. It is evident, from the discussion, that
erythema nodosum is still being considered as most com-
monly associated with rheumatic fever and tuberculosis.
In a critical survey of the data bearing on the relation
of this dermatosis to rheumatic fever, I (*Am. Int. Med.*
10 1686-1707, 1937) have presented evidence indicating
that erythema nodosum is probably not a manifestation of
rheumatic fever in the strict sense in which that disease
is understood today. In that paper the difficulties in ar-
riving at a diagnosis of erythema nodosum were also dis-
cussed, and among the simulating conditions mentioned
was a certain form of tuberculide. Case 24111 provides
an excellent illustration of that dermatosis, and the im-
portance of the presentation is increased by the nature of
the postmortem findings. I am taking this opportunity to
quote the description in my article for the purpose of
showing the essential similarities between my observa-
tions and those in Case 24111.

There is a more acute variety of erythema indura-
tum revealing transitions to papulonecrotic tubercu-
lides and resembling *erythema nodosum*. Of this
variant I have encountered three examples, character-
ized by the occurrence of cervical lymph node tuber-
culosis, typical papulonecrotic lesions about the el-
bows, and painful purplish red nodular efflores-
cences on the lower limbs. The latter simulated
ordinary erythema nodosum the resemblances being
further promoted by the failure to ulcerate and the
assumption of an intense purple hue in the course of
gradual involution. They differed however, in their

longer duration, in their association with typical lesions
of papulonecrotic tuberculides (*some of which failed
to show the characteristic central necrosis*) and in the
presence of chronic active tuberculosis of the lymph
gland variety. It is possible that this type may be
more properly labeled as papulonecrotic tuberculide
with atypical lesions on the lower extremities, the
physical attributes of the latter being markedly modi-
fied by location. [*Italics added.*]

Peculiarly enough, these 3 cases concerned women of
middle age and beyond, all had subfebrile temperatures
during some part of the course, and all recovered, at least
temporarily. Two of them were followed for many
months, of these one had a draining sinus in the neck,
which apparently healed after the use of ultraviolet and
x-ray radiation, though this required a long time. How-
ever, almost one year later, I ascertained that the cuta-
neous lesions had recurred on several occasions. In this
instance, also, the necrotic centers were so small and su-
perficial as to create the effect of dried vesicles, and as the
lesions were situated on the dorsums of the hands and
the extensor aspects of all the limbs, and as they recurred
in many crops, the eruption strikingly resembled Hebra's
erythema multiforme exudativum. The postmortem find-
ings in Case 24111 indicated strongly that this dermatosis
represents the result of a tuberculous infection disseminat-
ing in the secondary stage of Ranke and that this va-
riety of generalizing tuberculosis is not rare in persons of
advanced age. About two weeks ago I encountered still
another instance showing similar manifestations in a
woman some thirty years of age. Whether the eruption
is peculiar to women afflicted with childhood tuberculo-
sis it is difficult to state. The predilection for the lower
limbs and the painful attribute of the lesions are ex-
plained, at least partly, by the impaired circulation com-
monly observed in the lower limbs, notably in this sex.
Had the patient in Case 24111 recovered, there would un-
doubtedly have lingered in the minds of some observers
the impression that the case was an example of rheu-
matic fever with erythema nodosum.

Case 24092 (218 393-396, 1938) presents more impor-
tant implications. I am less concerned with the nonde-
script eruption seen in this case of miliary tuberculosis
than with the suggested diagnosis of systemic lupus erythe-
matosus and the comments made on the basis of the pa-
per published by Baehr, Klemperer and Schiffman (*Tr. A.
Am. Physicians* 50 139-155, 1935). As internists are likely
to derive their information from this article, and as this
condition and certain probably related syndromes appear
to be more common than has been hitherto suspected, it
seems pertinent to note that there are many controversial
points in this connection. For the present, I shall con-
fine myself to a brief discussion of the following funda-
mental subjects.

1 *The question of age and sex* Although systemic
lupus erythematosus most commonly affects young women,
it is by no means restricted to this group (*Arch. Dermat.*
& Syph 36 729-757, 1937). The condition is often ob-
served in girls, in women of more or less advanced age,
and occasionally in males (children and adults). In the
past few weeks, for example, I have seen 2 cases of the
disease in boys one of these came to necropsy, and the
other is still hospitalized. Several months ago I encoun-
tered an example of the condition in a man who died
postmortem examination was not performed.

2 *The question of atrophy in the cutaneous lesions*
Baehr, Klemperer and Schiffman stated that none of them
[the patients] ever had chronic discoid or atrophic le

sions,' a declaration based on an incomplete study of charts, insufficient material and failure to correlate the dermatological aspects. The probable reason why fewer instances of the atrophic form of this disease show an acute exacerbation at the present time will be mentioned under Point 3. It suffices to state (1) that atrophy in the dermatological sense is not an absolute criterion for the diagnosis of lupus erythematosus, (2) that "superficial" lupus erythematosus with constitutional symptoms may be later replaced by atrophic lesions in the skin, and (3) that there is no precise relation in all cases between the extent and attributes of the eruption and the severity of the systemic reaction—the fading of the cutaneous lesions is by no means an evidence of cure in the disease (Arch Dermat. & Syph 36 729-757, 1937, Brit. J. Dermat. 49 221-237, 1937).

3 *The question of a "new disease" and of photosensitivity* Baehr, Klemperer and Schiffrin attempted to establish a new disease, separating it from the cases "with the chronic discoid type of lesion and those with the essentially photosensitive skin" because 'they [the latter two] present a totally different clinical picture, are not of themselves fatal, and, in our opinion, represent different diseases.' What they meant by the cases "with the essentially photosensitive skin" is not made clear in their publication. It is common knowledge that chronic discoid lupus erythematosus may, in many instances, undergo dissemination following exposure to sun and ultraviolet radiation. Painful experience has shown that this is one of the diseases in which these two factors should be avoided, and the diffusion of this knowledge is one of the probable reasons for the lessened incidence of acute exacerbations in such instances. In many beauty parlors and elsewhere it is a current fad to apply ultraviolet radiation indiscriminately for the purpose of creating a "Palm Beach effect", this dangerous practice should be condemned unequivocally by the medical profession.

Baehr, Klemperer and Schiffrin remarked that 'it should be emphasized that none of our patients had previously shown any evidences of photosensitivity. With this statement I am obliged to disagree on the basis of personal observations made in many of the cases reported by them. In several instances I was able to ascertain that these patients were well aware of reactions following exposure to sun (severe headache, burns of an intensity out of all proportion to the degree of exposure, and so forth). In some cases the subject may feel sick after such exposure, without being able to define the symptoms precisely. To elicit this information it is essential, first, to make a correct diagnosis, and, secondly, to interrogate the patient carefully, with particular reference to a previous history of intolerance to sun. Only several weeks ago I had the privilege of observing another case in a girl who gave an excellent history of sensitivity to the rays of the sun, yet, this information was not recorded in the chart. A study based chiefly or entirely on chart work may therefore be defective in data of this sort. The subject of porphyria is still unclarified, and as the chemistry of these substances is in a state of flux, the topic need only be mentioned in passing.

There is, however, one more important point that promises to be of great interest, this concerns observations made by Turner (New Eng. J. Med. 216 158-161, 1937). He described the features of 3 cases of dermatomyositis, in 2 of which there was a history of sensitivity to sunlight. It is my intention, in another publication, to report a large group of personally observed cases showing transitions between systemic lupus erythematosus and dermatomyositis, and to indicate their essential affinities as well as their differences.

4 *The question of tuberculosis* Generalized lymphadenopathy, both clinically and at necropsy, is often encountered in systemic lupus erythematosus, and it represents a part of the disease. In some cases it may be a conspicuous feature. In occasional instances the nodes may break down, and this is often erroneously attributed to tuberculosis. In 1933 I stated that there were many cases in which necrotic foci had been found post mortem in these structures and in which minute anatomical study had revealed no evidence of tuberculosis (Arch. Dermat. & Syph. 28 765-779, 1933). The coincidental relation between these diseases was also stressed in another publication (Arch. Dermat. & Syph. 34 124-126, 1936). Later it was noted that such findings represent a peculiar feature in systemic lupus erythematosus (Arch. Dermat. & Syph. 36 729-757, 1937). Such necrotic foci may also be found in the spleen and other organs, and in the absence of microscopic study, these may be regarded as evidence of tuberculosis. It is to be emphasized that neither disease excludes the other and that, therefore, their occasional coincidence is not surprising.

Systemic lupus erythematosus is a disease known to dermatologists for a long time—actually over fifty years. One of the major contributions was the demarcation of atypical verrucous endocarditis (Libman and Sacks [Arch. Int. Med. 33 701-737, 1924]). Shortly before his death, Dr. Gross permitted me to read a paper in which he described distinctive microscopic features in this type of endocarditis, it is hoped that this article will be published posthumously. There is need for co-operation among the many specialists who observe this disease and related syndromes, for only by this means will it be possible to correlate knowledge.

H. KELL

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ANNUAL REGISTRATION

To the Editor In his letter to the *Journal* of April 14, Dr. Stephen Rushmore gives me credit for the defeat of annual registration which is altogether out of proportion to the work done by me. He fails to give credit to many of the district medical societies, as well as to the Council of the Massachusetts Medical Society, which has voiced opposition annually for the past three years. The presidents of the Society as well as the chairmen and members of the Committee on State and National Legislation, the legislative counsel and many others also deserve recognition. It is unreasonable to think that the Council for three years would voice its opposition without good reason therefor. The Board of Registration in Medicine has recommended three bills to the Legislature. In 1936 it recommended a bill on which the *Journal* editorially commented, in part

The real intent of the bill is slightly different from the obvious purpose which appears on superficial examination.

It was defeated.

In 1937 the Board recommended a bill that would have compelled the Board to publish annually for wide distribution lists of all registered physicians with their self-named specialties. It was defeated.

In 1938 the Board recommended the least harmful of the three bills, but many considered it merely an entering wedge for future amendments until the Board could gain the powers sought in the 1936 bill. It has already been referred to the next General Court.

The *Journal of the American Medical Association* on April 10, 1937, reported a discussion following a paper,

"Some Problems in Medical Licensure in Massachusetts, which was read before the Federation of State Medical Boards held in Chicago. In it, Dr. Rushmore is reported to have said:

The Board has again this year introduced a bill providing for annual registration of physicians. They introduced a bill last year and the Massachusetts state society opposed it. I think there is a fair chance that the society will oppose it again this year. Then the question will come up as to whether it is wise to drive it through over their opposition or whether it is better to wait another year and try to educate the society. As you can understand from our remarks, the society needs educating.

In his recent letter of April 14, he says:

The Board has made no drive. Such fight, drive, campaign or other effort is outside the province of the Board.

My interest in the problem of annual registration, which is wholly impersonal, was aroused by the editorial in the *Journal* on December 12, 1935, when the original drive for annual registration was started. This carefully written editorial, which has never been repudiated, would seem to be reliable as the secretary of the Board of Registration in Medicine is also a member of the editorial staff of the *Journal*. The editorial stated:

The real intent of the bill is to provide information as to which physicians the State now regards as qualified to practice medicine.

The *now* in the above statement seems to mean that the Board hoped to make a special list of its own choosing, or that it planned to eliminate those it thought not qualified, although already registered. Giving unnecessary powers to unknown appointees of unknown governors is apparently becoming less popular.

On March 19, 1936, February 12, 1937, and March 17, 1938, I have published letters on annual registration in the *Journal* and I believe them to be accurate, concise and strictly confined to the subject discussed. I deeply regret the necessity of making this reply.

RICHARD DUTTON, M.D.

Wakefield, Massachusetts.

HOSPITAL DAY AT THE NEW ENGLAND SANITARIUM AND HOSPITAL

To the Editor: Since the idea of a National Hospital Day was instituted back in the early twenties there has been a growing interest throughout the hospital field. Each year has found a larger number of hospitals taking part in the celebration and opening their doors to the public. This effort, perhaps as much as any other one factor, has served to educate the public in modern hospital procedure and facilities. Then, too, Hospital Day programs, as they have been carried on in many institutions, have been arranged so as to educate the public in sickness prevention, health habits and simple methods of home treatment.

Our institution here on the outskirts of Boston in Middlesex Fells Reservation has made education the theme of our Hospital-Day programs. We believe that it is the function of the modern medical institution, not only to treat those who come to them for care, but to educate the public in ways and means to preserve health.

Last year we were able so to publicize our activities that the Hospital Day Committee of the American Hospital Association awarded us the Parke, Davis Trophy for the

best Hospital Day publicity program of all hospitals in America.

This year we are again attempting to present such an educational program that the thousands of visitors who come here on that day will go away feeling that they have a fairly adequate idea of what the modern hospital can do for them in case of sickness, and also with a somewhat intelligent conception of how to maintain their health.

Our program for the day includes:

Morning chapel program on front lawn around flag-pole; nurses repeat Florence Nightingale pledge, devotional service, flag raising, talk by medical superintendent.

Tour of institution with educational displays in each department.

Speaker—Lieutenant Governor Francis E. Kelly, of Massachusetts.

Gymnasium exhibits: premature infant in incubator, portable x-ray on accident cases, portable diathermy on pneumonia cases, deep therapy lamp for treating surgical wounds, Balkan frame supporting traction for fractured leg, metabolism apparatus in use, electrocardiograph in use, oxygen tent for bronchitis patients, croup tent for bronchitis patients, hydrotherapy cart for bed treatments and health literature booth—Metropolitan Life Insurance Co. and John Hancock Mutual Life Insurance Co.

Dietetic booth.

Baby party and clinic.

Tree planting in memory of Matthew O. Foley, founder of National Hospital Day.

Awarding of prize to nurse exhibiting best health record last year.

The above program will be supplemented by talks in churches, clubs and public gatherings, radio talks, newspaper publicity, postcard and letter invitations, posters and stickers as provided by the American Hospital Association, movie trailers and periodicals.

If all the hospitals in our land put forth a concerted effort to enlighten the public on that day about what the hospital is able to do for them, it would be a mighty factor in breaking down any prejudice or misunderstanding that may exist in their communities.

PAUL R. CONE, *Chairman*

Hospital Day Committee.

New England Sanitarium and Hospital,
Stoneham, Massachusetts.

REPORTS OF MEETINGS

NEW ENGLAND HEART ASSOCIATION

The regular monthly meeting of the New England Heart Association was held at the Beth Israel Hospital on March 28. The following program was presented:

THE INCIDENCE OF THE CRITERIA OF ALLERGY IN CASES OF CARDIAC ASTHMA. Hyman Morrison, M.D.

Though it is now generally accepted that cardiac asthma, or paroxysmal nocturnal dyspnea, is brought about by left ventricular failure, this disease syndrome, especially when it is accompanied by wheezing, simulates so closely an attack of bronchial asthma that there are some clinicians who consider the two to be related genetically. To gain a better knowledge of this relation, cases of cardiac asthma, some with wheezing and others without, were studied with the collaboration of Dr. Abraham Colmes in the light of the criteria of allergy. The history of the incidence of allergy in the family and in the past life of the patient was obtained and other allergic manifestations and food peculiarities were determined, skin tests were done, and the blood studied for eosinophilia. The accompanying

table sums up these findings in the two groups compared with a group of control cases and with another of bronchial asthma with heart disease.

	NUMBER OF CASES	FAMILY HISTORY OF ALLERGY	PAST HISTORY OF ALLERGY	OTHER ALLERGIC MANIFESTATIONS	FOOD PECULIARITIES	POSITIVE SKIN TESTS	EQUINOPIHILIA OF 5+ %
Cardiac asthma with wheezing	11	1	0	1	6	6	2
Paroxysmal dyspnea with angina or edema without wheezing	11	1	0	2	2	6	1
Bronchial asthma with heart disease	48	21				39	14
Miscellaneous control cases	20	3	3	2	7	14	1

It was stressed that these figures do not justify the conclusion that cardiac asthma with wheezing can occur only in individuals who are allergic. Furthermore, it was questioned whether it is justifiable to consider wheezing, or musical rales, as pathognomonic of bronchospasm or allergy, especially as this sign is encountered in a number of diverse conditions such as acute and chronic bronchitis, pulmonary emphysema and bronchial obstruction due to foreign bodies or tumors, internal or external.

It is hoped that further data will be gathered to clarify this problem.

THE SIGNIFICANCE OF ELECTROCARDIOGRAPHIC CHANGES ASSOCIATED WITH ATTACKS OF ANGINA PECTORIS Joseph E. Riseman, M.D.

Continuous electrocardiographic tracings taken during exercise in 20 patients with angina pectoris show that the characteristic S-T changes associated with attacks of pain become evident long before pain develops and that the disappearance of these changes bears no constant relation to the disappearance of pain.

Electrocardiographic changes during attacks induced by breathing approximately 10 per cent oxygen while at rest were identical with those observed in the same patients during attacks induced by exercise.

The amount of work which patients could perform before developing an attack of angina pectoris could be increased appreciably by having them breathe pure oxygen continuously both before and during exertion. The characteristic S-T changes induced by a given small amount of exercise could be prevented by having the patient breathe oxygen before and during exertion.

It is apparent, therefore, that the electrocardiographic changes observed during paroxysms of angina pectoris are due to myocardial anoxia.

THE RELATION OF BLOOD PIGMENT METABOLISM TO THE CHANGES IN BLOOD VOLUME IN CONGESTIVE HEART FAILURE John Waller, M.D.

An increased plasma bilirubin is always demonstrable in chronic congestive heart failure. The anoxemia has been proved to impair the excretory power of the liver. Since Gibson and Evans have demonstrated a definite decrease in total blood volume in the recovery from congestive failure, an attempt to trace the fate of the red blood cells was made. Total urinary and fecal blood pigments, as urobilinogen, were determined, and the blood volume estimated by the method of Gregerson, Gibson and Stead. In the present study patients with severe chronic congestive failure were followed. It was found that a decrease

in the total circulating red blood-cell volume was, in every instance, accompanied by a marked increase in the urinary and fecal pigment excretion. The reticulocytes, as previously described, were found to be increased at the height of failure and to return to normal as the patient improved. The red-cell fragility to saline solution was definitely increased at the height of failure, beginning at 0.56 per cent saline, and also decreased toward normal as the clinical condition improved. The percentage of the total urobilinogen in the urine was related to the duration of the congestive failure, and presumably the degree of liver dysfunction, the greater the duration of failure, the larger the urinary fraction of urobilinogen.

It was concluded that the finding of increased blood volume in congestive failure, with return toward normal accompanying clinical improvement, had been confirmed and that information had been acquired regarding the mechanism of disposal of the red cells.

THE EFFECT OF DIGITALIS IN PARTIAL HEART BLOCK. Mark D. Altschule, M.D.

Considerable difference of opinion exists concerning the advisability of using digitalis in patients with partial heart block. Some authors feel that its use is contraindicated because of the danger of the development of complete block. Nineteen patients were studied, 6 had rheumatic heart disease and the others had coronary arterial disease. In all, the P-R interval was prolonged, and in addition, 2 had frequent dropped beats and alternating 2:1 and 1:1 response. Digitalis was administered in doses calculated in the usual manner from the body weight. Electrocardiograms were made before and after digitalization. In no case did an increase in P-R interval or the development of a higher grade of block occur. The only changes noted in the electrocardiogram were typical changes in the T wave due to the administration of digitalis, and in some cases, slowing of the heart. It was concluded that digitalis in the usual therapeutic dosage can be given when indicated in patients with partial heart block without precipitating complete heart block.

THE CLINICAL AND PATHOLOGIC MANIFESTATIONS OF CORONARY ARTERIAL DISEASE AS DISCLOSED BY INJECTION PLUS DISSECTION STUDIES David Davis, M.D.

Using the method developed by Schlesinger, the condition of the coronary arteries was studied in 89 hearts to determine the anatomic basis of angina pectoris and of coronary thrombosis.

Of the 89 patients there were 11 with a history of un complicated angina pectoris, months to years in duration. All these hearts showed extensive coronary artery disease with complete occlusion of one or more of the major coronary branches. In all, there also was extensive disease involving one or more of the remaining major branches, so that an area formerly supplied by an occluded vessel was found to be receiving blood through anastomotic channels from other substituting arteries, which themselves had become diseased and narrowed by atheromatous processes.

In another group of 11 patients of approximately the same age who had never had angina pectoris, and 8 of whom died of non-cardiac causes, the hearts also showed complete occlusion of one or more of the major coronary branches. Since patients with angina pectoris almost invariably show coronary disease, the members of this second group were likely candidates for angina pectoris. They had not had any anginal symptoms presumably because

the slow occlusion of a major coronary branch often is silent, on account of the gradual development of adequate anastomotic circulation from the neighboring arteries. Thus when symptoms of angina are first experienced, it appears probable that one or more arterial occlusions have already occurred, the symptoms of angina are due to ischemia resulting from disease in and failure of the previously adequate anastomotic circulation. This apparently was the mechanism in the 11 patients with angina pectoris.

In a third group of 11 patients, who presented the clinical syndrome of coronary thrombosis, the hearts of 9 showed essentially the same mechanism. In these, there was extensive disease or occlusion in two or more major coronary branches, and either definite evidence of infarction was found or a fresh thrombus was revealed without histologic evidence of infarction. Under the latter circumstances, sufficient time may not have elapsed before death to reveal pathological evidence of infarction. It would appear that the extent of arteriosclerotic involvement in patients with coronary thrombosis and cardiac infarction is not clearly different from that found in those with angina pectoris without infarction. The occurrence of cardiac infarction would seem to be due, in large part to the rapidity with which thrombosis and occlusions occur. If sufficient time is not available for the establishment of an adequate anastomotic circulation, then infarction will occur.

THE BREATH HOLDING TEST. A SIMPLE STANDARD STIMULUS OF BLOOD PRESSURE. David Ayman, M.D.

One of the outstanding characteristics of essential hypertension is the variability of the blood pressure under the influence of different stimuli such as excitement, pain and cold. The variability of the blood pressure has been investigated by many men who have attempted to apply standard methods of stimulating the blood pressure. Most of these methods have not been adopted for clinical study due to their lack of simplicity.

In 1932, Hines and Brown introduced a simple standard stimulus, consisting of placing the hand, up to the wrist, in cold water, the temperature of which is maintained at 4°C. The hand is kept in the ice water for sixty seconds and the reading of the blood pressure then made. The test is carried out only after the subject has rested and after a basal level of blood pressure has been secured. Since their first paper, Hines and Brown have reported results in 571 subjects. They found that their subjects with normal blood pressure could be divided into two groups, hypo-reactors and hyper-reactors. Subjects with definite essential hypertension showed hyper reactions. In a subsequent study of families, Hines showed that the hyper reaction occurred only in families in which one or both parents had hypertension or a hyper reaction. Where both parents had normal blood pressure and had a hypo-reaction, the children all had hypo-reactions and normal blood pressures. Further, when studying the incidence of the hereditary factor in hypo-reactors and hyper-reactors and patients with essential hypertension, Hines and Brown found that 84.6 per cent of the hyper-reactors and 86.6 per cent of the subjects with essential hypertension had a family history of cardiovascular disease, while only 17.2 per cent of the hypo-reactors had such a positive family history.

The present study involved, first, a repetition of Hines and Brown's cold pressor test. In 313 cold tests, the results compared closely with theirs. Secondly, in order to devise an even simpler pressor test, the breath holding test

was developed. In this test, the subject closes the nose tightly with his fingers, shuts his mouth tightly, and holds his breath in quiet expiration. The systolic blood pressure reading is made at the end of 20 seconds. The subject is then allowed to breathe and after another basal blood-pressure level is obtained, the test is repeated for the diastolic blood pressure reading. The results of 596 breath-holding tests showed a close similarity to the results of the cold-pressor test carried out in the same patient. Whatever the significance of standard pressor tests may be, the breath holding test is simpler, more rapid and as accurate as the cold-pressor test.

CARDIAC CIRRHOSIS. Herrman L. Blumgart, M.D.

Confronted in certain cases of congestive failure with the question of cardiac cirrhosis and with the paucity of pertinent available information, an investigation was undertaken of an unselected series of consecutive cases in order to learn (1) the incidence of hepatic fibrosis in all cases with congestive heart failure, (2) the types and degrees of such hepatic fibrosis found in cases of congestive failure, (3) the differences between these findings and those found in the cases without congestive failure, and (4) the incidence of hepatic fibrosis due to congestive failure compared to that due to biliary tract disease.

Of patients dying with congestive heart failure, approximately a third showed increased hepatic fibrous tissue, which was twice the general incidence of the 2000 consecutive autopsies. The causal significance of chronic passive congestion in the production of hepatic cirrhosis was emphasized by the increasing incidence and severity of the cirrhosis with increasing duration of congestive heart failure. The only type of cirrhosis peculiar to cardiac decompensation was central cirrhosis.

Of particular interest was the finding of Laennec's cirrhosis in 22 per cent of the patients with congestive failure as compared with 9 per cent in the remainder of the series. Central and portal cirrhotoses coexisted in 18 cases and were associated with congestive heart failure in every case, with but one exception. This suggests that chronic passive congestion, with resulting anoxemia, may increase the susceptibility of the hepatic tissue to injury in the portal as well as in the central areas.

From the foregoing evidence, the meaning of cardiac cirrhosis is clarified. In the morphologic sense of increased fibrosis being due to chronic passive congestion, one may state that the majority of patients who have suffered from even mild congestive failure for nine months or more show increased fibrosis of the liver, the cirrhosis being usually either central or portal in type.

Whether cardiac cirrhosis in the clinical sense of increased fibrosis causing clinical manifestations is present or not must be based on clinical evidence. This was discussed in the light of the evidence gained from study of the series of patients.

NEW ENGLAND SOCIETY OF PSYCHIATRY

The following men were elected as officers of the New England Society of Psychiatry for the year 1938 at its annual meeting which was held at the Neuro-Psychiatric Institute of the Hartford Retreat, Hartford, Connecticut on April 26: president, Dr. Harlan L. Paine, superintendent of Grafton State Hospital, North Grafton; vice president, Dr. Forrest Tyson, superintendent of Augusta State Hospital, Augusta, Maine; secretary-treasurer, Dr. George A. Elliott, assistant superintendent, Connecticut State Hospital, Middletown; councilors, Dr. Chester Waterman, superintendent of Norwich State

Hospital, Norwich, Connecticut, and Dr Roy D Halloran, superintendent of Metropolitan State Hospital, Waltham, Massachusetts

Dr Louis Cohen of the Research Department of the Worcester State Hospital, Worcester, presented a very interesting paper on "Metrazol Treatment in Schizophrenia."

GEORGE A ELLIOTT, *Secretary Treasurer*

BROOKFIELD MEDICAL CLUB

The Brookfield Medical Club held its 559th meeting at Ye Olde Tavern, West Brookfield, on April 20

Dr C J Huyck, of West Brookfield, was host, and Dr Gardner Cobb was guest speaker. He spoke on "Observations in Pediatrics." Discussion followed.

Dr James Murphy, of Palmer, will be host at the next meeting which will be held on Wednesday, May 18

JOHN R. FOWLER, M.D., *Secretary*

HOSPITAL COUNCIL OF BOSTON

At the annual meeting of the Hospital Council of Boston, which is composed of twenty four hospitals in Greater Boston, Frank E. Wing, director of the Boston Dispensary, was chosen president, and Dr Charles F Wilinsky, secretary treasurer. Rev Thomas J Brennan, superintendent of St. Elizabeth's Hospital, and Dr James W Manary, director of the Boston City Hospital, were elected to the executive committee.

In the annual report, presented by Dr Joseph B Howland, the need for more free and part time evening clinics was stressed. During 1937, admissions of member hospitals increased 47 per cent, hospital days 57 per cent and outpatient visits 44 per cent over the figures for 1936

NOTICES

BOSTON SOCIETY FOR THE ADVANCEMENT OF GASTROENTEROLOGY

The next meeting of the Boston Society for the Advancement of Gastroenterology will be held in the Cheever Amphitheater of the Boston City Hospital, on Wednesday, May 18, at 12 o'clock noon.

Dr Martin E. Rehfuess, clinical professor of medicine, Jefferson Medical School, Philadelphia, will lecture on "The Gall Bladder Problem."

C W McCLURE, M.D., *Secretary*

BOSTON CITY HOSPITAL

There will be a monthly conference of clinical pathology at the Boston City Hospital, on Wednesday, May 11, at 12 o'clock noon, in the Pathological Amphitheater

JOSEPH E HALLISEY, M.D.,
Secretary Medical Staff

SUMMER COURSE IN FORENSIC MEDICINE

The annual postgraduate course in forensic medicine in the New York University College of Medicine will be repeated again during June of this year

Intended chiefly for coroners, coroners physicians, medical examiners and other physicians interested in medico-legal work, the course will consist of lectures and practical

instruction in the necropsy rooms and laboratories of the chief medical examiners of New York City and Essex County, New Jersey

Dr John H. Mulholland, assistant dean of the college, is in charge of registration for the course.

POSTGRADUATE COURSES IN PARIS

Word has been received from L'Association pour le Développement des Relations Médicales that a series of short courses (in English) on medical subjects will be given in Paris during the last week in June and the first two weeks in July. Each course will consist of six lectures or demonstrations in the mornings or afternoons, or both, of a given week. The subjects to be covered are cardiology, ophthalmology, gynecology, endocrinology, pediatrics, neuropsychiatry, dermatology, histology, physiology, ureteropyelography and abdominal surgery. They will be given by members of the Faculté de Médecine. The charge for each of the morning or afternoon courses is 300 Fr. fr., and for both 500 Fr. fr.

Further information may be obtained by writing to Bureau de l'A.D.R.M., Salle Beclard, Faculté de Médecine, Paris, VIe.

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve-thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen, discussed, and when indicated, treated with radium and high voltage x-ray.

Physicians are welcome to visit this clinic and bring patients to the clinic for diagnosis.

NATIONAL HOSPITAL DAY

The New England Hospital Association and the Massachusetts Hospital Association are working together with the National Committee of the American Hospital Association in the observance of National Hospital Day, Thursday, May 12.

Many hospitals are making extensive plans in the observance of this day. Hospitals throughout New England will have "open house" in order that former patients and friends may visit the hospital to see the latest scientific equipment and apparatus used in the modern treatment of patients.

All members of medical societies are urged to cooperate with hospital administrators by taking part in clinical demonstrations and lectures that may be of interest to the lay public.

Time has been reserved on the air for May 10 and 11, and medical men have been secured to talk on "Our Hospitals."

JOSEPH P. LEONE, M.D.,
National Hospital Day Chairman,
Massachusetts Hospital Association

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, May 17, at 12 o'clock noon.

Dr Abraham Colmes will speak on "Simplifying the Approach to Clinical Allergy."

All physicians are cordially invited to attend.

JOHN B. HALL, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MAY 9

TUESDAY MAY 10

- 9-10 a. m. Boston Dispensary Medical History of Appendicitis
Dr Reginald Fitz
- 10 a. m. 12-30 p. m. Tumor clinic. Boston Dispensary

WEDNESDAY MAY 11

- 9-10 a. m. Boston Dispensary Hospital case presentation Dr S J Thannhauser
- 1 p. m. Clinicopathological conference. Children's Hospital amphitheater
- 1 p. m. Boston City Hospital Conference of Clinical Pathology Pathological amphitheater

THURSDAY MAY 12

- National Hospital Day
- 9-10 a. m. Boston Dispensary Social service case presentation Mrs. H B Hooker and Miss E. Grundy

FRIDAY MAY 13

- 9-10 a. m. Boston Dispensary The Course of Heart Disease and the Precipitating Factors of Heart Failure. Dr C. Sidney Burwell
- 10 a. m. 12-30 p. m. Tumor clinic Boston Dispensary
- 1 p. m. Clinical meeting of the Children's Medical Service Massachusetts General Hospital Eber Dome.

SATURDAY MAY 14

- 9-10 a. m. Boston Dispensary Hospital case presentation Dr S J Thannhauser
- 10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A. Christian

*Open to the medical profession

- MAY 5—Faulkner Hospital clinicopathological conference 5 p. m.
- MAY 11—Boston City Hospital Conference on Clinical Pathology Page 4
- MAY 12—Pentucket Association of Physicians Hotel Bartlett 95 Main Street, Haverhill 8-10 p. m.
- MAY 12—National Hospital Day Page 788
- MAY 16 and 17—American Neisserian Medical Society Page 532 issue of March 31
- MAY 17—South End Medical Club Page 768
- MAY 18—Brookfield Medical Club Page 788
- MAY 18—Boston Society for the Advancement of Gastroenterology Page 5
- MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston
- JUNE 1 and 2—National Society for the Advancement of Gastroenterology Page 46, issue of April 28
- JUNE 6 7 8 and 9—American Association of Industrial Physicians Page 499 issue of March 17
- JUNE 10 and 11—American Heart Association Page 707 issue of April 21
- JUNE 13-17—American Medical Association. San Francisco
- JUNE 13 OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 267 issue of February 10
- SEPTEMBER 12-14—American Association for the Study of Gout Page 545 issue of March 24
- OCTOBER 17-21—Clinical Congress of the American College of Surgeons New York City
- OCTOBER 24-26—Academy of Physical Medicine, Scientific Session Washington, D. C.

DISTRICT MEDICAL SOCIETIES

BRISTOL SOUTH

MAY 5—5 p. m. New Bedford

ESSEX SOUTH

MAY 5—Censors meet at Salem Hospital 3-30 p. m.

MAY 11—Annual meeting Salem Country Club Peabody Dinner at p. m.

FRANKLIN

Meeting will be held at the Franklin County Hospital Greenfield at 11 a. m. the second Tuesday of May

HAMPSHIRE

Meeting will be held on the fourth Tuesday in July

HAMPSHIRE

MAY 11—Page 546 issue of March 24

MIDDLESEX EAST

Meeting will be held at the Bear Hill Golf Club Stoneham at 12 15 p. m. MAY 11

NORFOLK DISTRICT

The censors meet on the first Thursdays of May and November in each year

NORFOLK SOUTH

MAY 5—Annual meeting Page 746 issue of April 28

PLYMOUTH

Meetings will be held at 11 a. m. on May 19 and July 21

WORCESTER

MAY 11—Afternoon and evening annual meeting Place and schedule of program to be announced.

BOOKS RECEIVED FOR REVIEW

Modern Dietary Treatment Margery Abrahams and Elsie M Widdowson. 328 pp Baltimore William Wood & Company, 1937 \$3.25

Treatment of Some Chronic and Incurable Diseases A T Todd. 203 pp Baltimore William Wood & Company, 1937 \$3.00

The Hair and Scalp A clinical study (with a chapter on hirsuties) Agnes Savill Second edition. 309 pp Baltimore William Wood & Company, 1937 \$4.75

Wheeler and Jack's Handbook of Medicine Revised by John Henderson. Tenth edition. 703 pp Baltimore William Wood & Company, 1937 \$4.00

Medicine for Nurses W Gordon Sears Second edition. 435 pp Baltimore William Wood & Company, 1937 \$3.25

Tuberculosis Among Children and Young Adults J Arthur Myers Second edition. 401 pp Springfield, Illinois, and Baltimore Charles C Thomas, 1938 \$4.50

Pharmaceutical Latin For pharmaceutical medical dental and veterinary students and practitioners Jacob S Dorfman Second edition 146 pp Philadelphia Lea & Febiger, 1938 \$2.00

Medical Writing The technique and the art Morris Fishbein, with the assistance of Jewel F Whelan. 212 pp Chicago Press of the American Medical Association, 1938 \$1.50

Vade Mecum of Medical Treatment W Gordon Sears. 368 pp Baltimore William Wood & Company, 1937 \$4.00

Synopsis of Obstetrics and Gynaecology Aleck W Bourne. Seventh edition. 452 pp Baltimore William Wood & Company, 1937 \$4.00

Diseases of the Skin A manual for students and practitioners Robert M MacKenna Revised and enlarged by Robert W B MacKenna Fourth edition 557 pp Baltimore William Wood & Company, 1937 \$7.00

BOOK REVIEWS

X Rays and Radium in the Treatment of Diseases of the Skin George M MacKee. Third edition, thoroughly revised. 830 pp Philadelphia Lea & Febiger, 1938 \$10.00

This book covers very thoroughly the therapy of skin diseases by x ray and radium. Two previous editions have been published, and the present one has been largely rewritten in view of the progress which has been made in this field. The author has contributed largely to this progress and in this edition has enlisted the collaboration of other authorities in various phases of the subject. The physics of the radiation used in skin diseases has been brought up to date and amplified by Dr Edith Qumby. The matter of dosage and the measurement of dosage, together with the factors governing it, are emphasized. The

effects of x rays, both biologic and biochemical, are reviewed in considerable detail, with a very characteristic picture being drawn of the pathologic effects of radiation. Almost half the book is devoted to the use of radiation in the treatment of various dermatoses. Emphasis is placed on the diseases in which radiation is an important factor, and numerous excellent clinical photographs before and after treatment, from the author's large collection, are included. The many diagrams and tables in the earlier part of the book and the numerous references at the end of each chapter make it an almost indispensable book to the physician treating skin disease. A final chapter on the medicolegal aspects rounds out the book. There is no comparable book in English on this subject.

A Textbook of Hematology William Wagner 395 pp
Philadelphia P Blakiston's Son & Co, Inc, 1938
\$4.50

Following a long dearth in English texts on hematology, there has appeared a series of books, large and small, dealing with this subject. One of these is the book by Wagner, a Canadian pathologist, whose primary purpose is to write for the practicing physician. Despite its apparent simplicity, the subject is quite well covered, although not infrequently one is struck by the somewhat uncritical view which the author takes of his quoted literature. This is in all probability due to his relative unfamiliarity with the clinical problems of the hematologist. Hematology has gradually been taken over by the clinician, and rightly so, since hematological problems are so completely intertwined with those of general medicine.

The book suffers from very amateurishly made colored plates, which are poorly lithographed, and from atrociously executed oil immersion photomicrographs of blood smears. The descriptions of laboratory methods are frequently slipshod, as in the section on the estimation of cell volume where the recommendation is made that "well shaken oxalated blood" be used without any statement as to the type or percentage of oxalate, the centrifuge speed, necessity for packing, and so forth. No mention is made of the widely used mean corpuscular volume, or of the coverslip method for making blood smears. Osgood and Wilhelm's method for counting reticulocytes is featured (this gives counts much too high), and counting "the number of reticulocytes amongst 200-300 red cells" is advised. Only the puncture method of performing the bone marrow biopsy is mentioned, no statement regarding the much more accurate trephine method being made. There is a good section on the iron-deficiency anemias, and in general the discussion on the anemias is good. Again, some of this is invalidated by lack of clinical experience, as in the statements that in the majority of cases of pernicious anemia the neurological examination yields negative results and that the injection of 1 cc. of liver extract every three or four weeks is sufficient for maintenance of the proper red-cell level. Both of these statements are contrary to the reviewer's experience. There are many errors in spelling of authors' names, both in the text and in the bibliography. There is no mention of the neoplasms of the white cells or of Hodgkin's disease, but seven pages are given to a discussion of the very rare condition of osteosclerosis involving the marrow, apparently because the author has seen a case.

The book, although it has much to commend it in simplicity of style and good general discussion, loses considerably in value because of numerous defects which may possibly be corrected in a future edition.

A Method of Anatomy Descriptive and deductive J C. Boileau Grant. 650 pp Baltimore William Wood & Company, 1937 \$6.00

It is refreshing to examine a book of anatomy with the arresting title of "a method of anatomy." The use of the phrase 'descriptive and deductive' as a subtitle gives one the impression that the primary purpose of the book is not alone the presentation of anatomic facts, but also the consideration of pedagogic principles which help give understanding to these facts. In the preface the author calls attention to the fact that the purpose is to lead the student to approach the subject from the point of view of studying anatomic facts in their mutual relations and of apprehending the underlying principles involved and the *raison d'être* of such relations. By dipping into embryology, comparative anatomy, clinical medicine and surgery, and cognate sciences, the author has succeeded admirably in his task to elucidate what would otherwise be dry facts.

The logical clarity of exposition and the terse, clear style of the book strike one at every page. One is impressed with the 564 accurate diagrammatic line drawings based on carefully dissected material. The format with its 750 large double-column pages will, it seems, make a strong appeal to the student. An interesting feature which calls for special mention is the discussion of "Key Positions" in the consideration of the various regions of the body. The terminology employed with few exceptions is the Birmingham Revision of the B N A.

It seems to the reviewer that a future edition would benefit by the introduction of radiographs, a brief discussion of the growth of the face, a figure showing the plan of the fetal circulation, a more complete account of the innervation of the joints, and a general consideration of the action of the muscles of the back. Although the author states that this book is not a dissecting guide, it would seem desirable to introduce more directions for dissection. No doubt such additions would have increased the size of the book appreciably, but this would not have been a disadvantage.

The author is to be congratulated upon his interesting treatment of the subject and will be rewarded by the strong appeal which this book is sure to make to students, physicians and surgeons.

Treatment in General Practice Harry Beckman Third edition 787 pp Philadelphia and London W B Saunders Company, 1938 \$10.00

This is the third edition of a book on treatment in general practice which has already gained considerable popularity among students and practitioners. It reflects in its simplicity of style and conciseness the author's long teaching experience in this field. Bits of history here and there are of additional interest.

The book lacks the usual chapter arrangement, and only one section, its first and largest, which deals with infectious diseases, has any definite order, topics appearing alphabetically. This means a loss of the natural sequence and proportionate importance of diseases expected in the conventional textbooks on medicine.

Another criticism is the author's modest consideration of himself as an author, he acknowledges as his sources over eight hundred items in the recent periodical literature, as listed with their authors in the bibliography. A textbook, especially one in therapeutics, should be an unqualified authority.

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THE EFFECT OF IRRITANTS AND DRUGS AFFECTING THE AUTONOMIC NERVOUS SYSTEM UPON THE MUCOSA OF THE NORMAL RECTUM AND RECTOSIGMOID, WITH ESPECIAL REFERENCE TO 'MUCOUS COLITIS'

BENJAMIN V. WHITE, JR., M.D.,* AND CHESTER M. JONES, M.D.†

BOSTON

THIS investigation presents certain observations on the physiologic processes of the rectum and rectosigmoid, which may throw some light on those disorders of the colon apparently concerned with physiologic rather than anatomic abnormality. The changes observed are of two kinds: those affecting the appearance of the mucous membrane as observed through the sigmoidoscope, and those affecting the motility of the rectal wall.

Few studies of the rectal and colonic mucosa in response to the administration of drugs have appeared. Watts and Fulton¹ reported ulcerative lesions of the entire gastrointestinal tract, including the colon, following the production of artificial hypothalamic lesions in monkeys subsequently studied post mortem. The production of experimental gastrointestinal lesions by neurogenic stimulation has also been accomplished in a small percentage of cases by Keller, Hare and d'Amour.² These workers produced lesions in the region of the hypothalamus, and found that those cases in which hemorrhage into the ventricle had occurred or in which the lesions had been made in the anterior portion of the hypothalamic area most frequently showed gastrointestinal changes, hyperemia, hemorrhage and erosions. These alterations occurred in all parts of the gastrointestinal tract, including the colon, where the crests of the longitudinal folds showed hyperemia and in some cases frank hemorrhage.

Light, Bishop and Kendall³ consistently succeeded in producing ulceration of the stomach by the injection of 10 mg. of pilocarpine hydrochloride into the lateral ventricles of rabbits. Other parts of the gastrointestinal tract were not specifically examined. Banung and Hall⁴ has in the course of

other studies produced gastric ulcers and colonic lesions, probably through overstimulation of the parasympathetic nervous system. Larson and Barger⁵ and Barger⁶ introduced a technic of withdrawing an isolated loop of colon through the anterior abdominal wall. They were thus enabled to study quantitatively changes in mucus formation in the dog. They made studies following the use of different types of cathartics, and in one instance laid the extra-abdominal portion open, so that they could observe the surface in action. They found that the amount of mucus secreted during sleep was at a minimum, and that it was increased after defecation, and still more after defecation stimulated by catharsis. Saline cathartics produced the most normal mucus, castor oil the greatest quantity.

Forsell's⁷ barium relief method, which has been applied successfully to gastric roentgen study by Berg,⁸ has afforded a third avenue of approach to the study of the mucous membrane of the colon. Knothe,⁹ using this technic, made careful observations on the colon in normal and pathologic states, and believes it possible to recognize minimal mucosal changes, such as those seen in "mucous colitis," by this means. He has not, however, published any studies showing the effect of drugs on the colonic mucosa.

The electrically lighted sigmoidoscope affords another and more direct method of approaching the problem. Singer¹⁰ was among the early workers to describe the mucosal changes in mucous colitis which have been subsequently confirmed by other workers,¹¹ but this method has received little attention as a means of investigating the effect of drugs upon the normal mucosa.

The motility of the colon has been more fully observed. Bayliss and Starling¹² found that stimulation of the wall of the denervated small intestine was followed by contraction immediately above and relaxation immediately below the point of stimulation. He termed this phenomenon the "law of

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the intestine" and believed that it was responsible for the forward movement of intestinal contents Cannon¹³ inferred from these and his own observations that this mechanism was at least partially responsible for the movement of fecal masses in the colon Hertz¹⁴ also seems to hold this view, stating that the rectum is normally empty, but that when a fecal bolus is allowed to drop into it from the rectosigmoid the defecation reflex is established Hertz describes a clinical type of constipation, "dyschesia," in which the rectum fills with fecal matter without exciting the defecation reflex, and he is at a loss to explain the syndrome because he finds that all normal rectums are insensible to thermal and painful stimuli Hines, Lueth and Ivy¹⁵ found in an unselected group of constipated persons that the rectum frequently failed to contract deeply when a balloon was inserted in the ampulla, whereas in the normal controls, deep, painful urges occurred

SELECTION OF SUBJECTS AND METHOD

In the present study, autonomic stimulating and inhibiting drugs and irritants were applied directly to the mucosa of the rectosigmoid, and in some instances were administered by mouth The mucous membrane was observed directly

All the control observations were made on male medical students between the ages of twenty-two and twenty-six All had essentially normal bowel habits, although 2 had been subject to changes related to emotional strain One (W.O.L.), a collegiate runner, had had diarrhea for three days before each race and constipation for three days afterward Another (S.T.) had suffered from emotional constipation The men were all in good health, and so far as is known were not suffering from any intercurrent disease A few observations on patients with "mucous colitis" are also reported

For observation of the colonic and rectal mucosa, an electrically lighted sigmoidoscope was employed Local applications were administered by small gauze pledgets held in the jaws of a modified bronchoscopic sponge holder Observations were made after evacuation, and in most cases at nine o'clock in the morning after breakfast, in order to obtain a consistent series of observations Except where specifically noted, preparatory enemas were avoided All observations were made with the subjects in the knee-chest position on a well-padded examining table

The following substances were applied locally on at least two occasions each, in the following concentrations benzedrine sulfate 1 per cent, epinephrine hydrochloride 0.1 per cent, physostigmine sulfate 1.0 per cent, atropine sulfate 0.5 per cent, pilocarpine hydrochloride 1 per cent, sodium

chloride 17 per cent, and oil of turpentine Acetyl- β -methylcholine chloride was administered by mouth in varying dosages, as were carbaminoylcholine chloride and benzedrine sulfate The irritant solutions, 17 per cent sodium chloride and turpentine, were kept in tightly stoppered bottles The solutions of drugs affecting the autonomic nervous system were freshly prepared from tablets or crystals

During the observation the mucosa was examined at intervals and the following characteristics were particularly noted

- 1 The degree of injection, the location in relation to the rectal valves, and to a certain extent the duration of the change were studied

- 2 The appearance of mucus, whether as a diffuse, glairy sheen, a frank accumulation of moist secretion or a dried coating partially adherent to the bowel wall, was observed

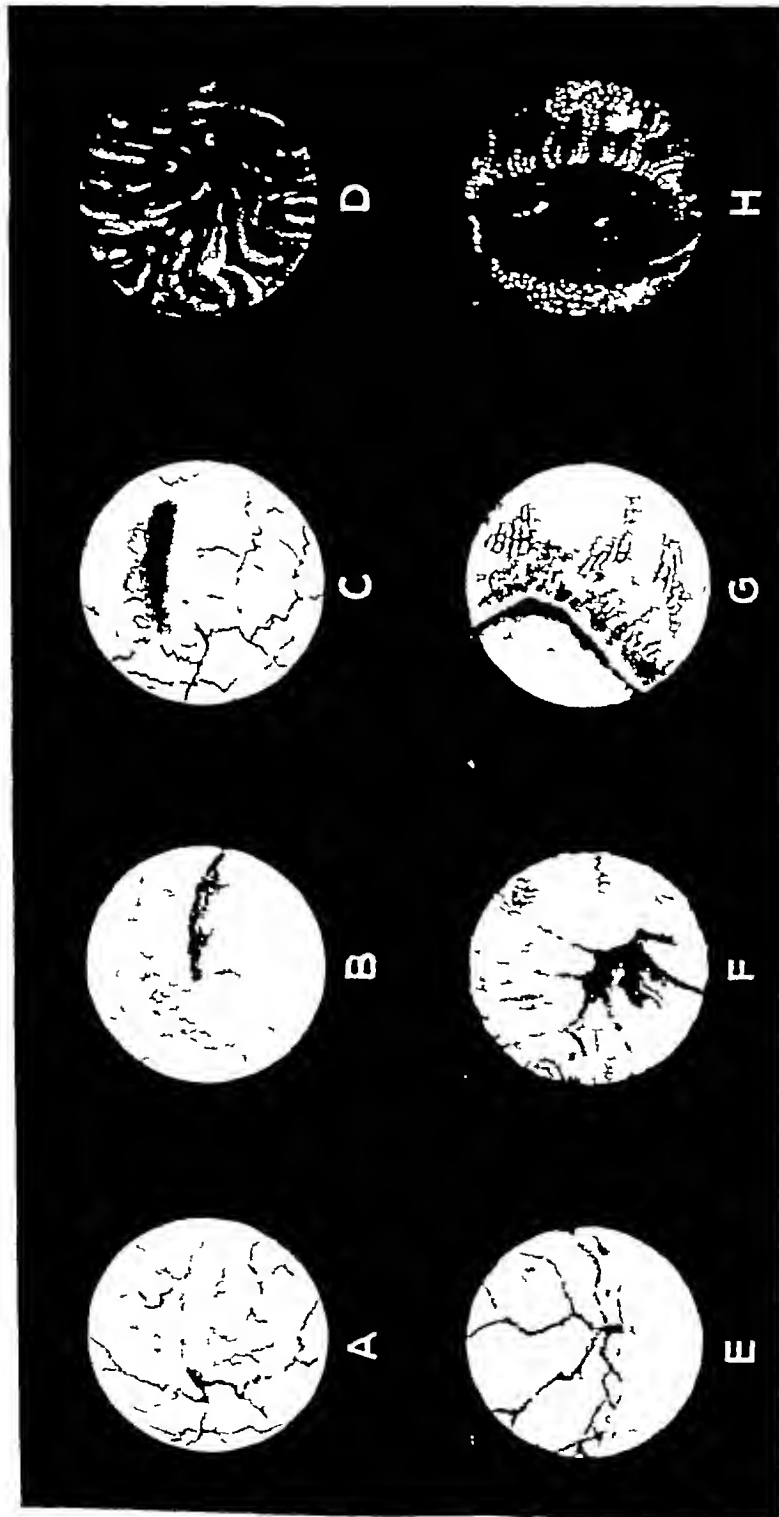
- 3 Attention was paid to the appearance of the veins and venules, which in some cases were widely engorged and elevated above the surface, but in others were obscured by generalized injection

- 4 Granularity and wrinkling of the mucosal surface, probably fundamentally different in their pathological significance, were found to be almost indistinguishable as seen through the sigmoidoscope. In observations upon the normal rectosigmoid it was assumed that roughness of the surface was produced by simple wrinkling of the mucous membrane In patients with "mucous colitis," however, this distinction was not relied upon

- 5 The presence or absence of changes in caliber of the intestine, the appearance or relaxation of spasm and the occurrence of rhythmic activity were observed When rhythmic activity followed the administration of irritants the exact number of contractions per minute was recorded

In most cases only one observation was made in a morning In a few cases irritants were applied at first in the sigmoid and then in the rectum, but owing to the possibility that the physiologic response was due to a summation of stimuli this procedure was discontinued In a number of cases atropine was applied after cholinergic drugs had been given, and its effect was also observed in patients with rectosigmoid spasm

Each irritant substance was applied on one occasion in the ampulla of the rectum between the middle and upper valves, and at another time in the sigmoid above the upper rectal valve, usually at the level of the left internal hypogastric artery. Sodium chloride was employed in a concentration of 17 per cent, because such a stock solution was used in the preparation of routine physiological saline and was available in the drug department It



Drawings by M. McLachlan

PLATE I

Appearance of Mucosa of Rectosigmoid under Experimental Conditions. A — control observation, B — two hours after standard soapuds enema, C — immediately after the application of 17 per cent sodium chloride solution locally, D — five minutes after 1 per cent pilocarpine hydrochloride locally, E — five minutes after the local application of 1 per cent physostigmine sulfate, F — fifteen minutes after the local application of 1 per cent physostigmine sulfate, G — after the oral administration of 1000 mg of acetyl beta methylcholine chloride per day for four days. All these observations were made on one subject (E. L. L.) and, with the exception of B, were made without preparation. H — lower sigmoid of a patient with advanced mucous colitis, without preparation. Note the generalized injection, the reduction in caliber and the granular rough surface, sheets of dried tenuous mucus, which were present, do not show in this field. The veins are not dilated at this stage of the disease.

proved to be highly irritant. Oil of turpentine was applied undiluted.

OBSERVATIONS

Below are recorded the observations made after the local administration of drugs to the mucosa of the rectosigmoid. In the case of the purely irritant substances the site of application is noted because of the difference in the response to applications in the rectal ampulla from that resulting from stimulation in the lower sigmoid. In the case of the autonomic stimulating or inhibiting substances the exact site of application is omitted in the interest of simplicity.

A colored drawing of the appearance of the rectosigmoid mucosa of a normal subject (E.L.L.) who had received no preparation for the examination is recorded in Plate 1*a*. A similar illustration (Plate 1*b*) shows the change in appearance two hours after a standard soapsuds enema (120 cc. of liquid soap dissolved in 2000 cc. of water and administered at 104°F). A moderate degree of generalized injection, with the appearance of a diffuse glairy surface, is apparent. In some subjects greater amounts of mucus, even amounting to distinct blobs, appeared. It was interesting to note that the subject just mentioned reacted less strikingly to all forms of stimulation than did some of the others.

Hypertonic salt solution a 17 per cent solution of sodium chloride, when applied locally for two periods of thirty seconds each, invariably produced a local, circumscribed erythematous area which soon became covered with a glairy, glistening mucoid secretion. The markings of the veins disappeared in the brilliantly injected center of the lesion. This response is illustrated in Plate 1*c*.

In addition to the local mucosal reaction, hypertonic salt solution appeared to have the property of setting up definite waves of contraction of the musculature of the upper rectum when locally applied at this site. This phenomenon was observed in 8 of 10 subjects. Partial spasm of the rectosigmoid sphincter was noticed in 7 of the 10 individuals. The rate of the peristaltic contraction in the rectal ampulla is recorded graphically in Figure 1. The peristaltic waves so set up are of low amplitude, but for each subject a strikingly characteristic rate is present, a fact which in a number of cases has been confirmed by subsequent stimulation with other substances.

When hypertonic salt solution was applied in the sigmoid above the upper valve, 1 subject, whose peristaltic rate had been 16 per minute on rectal stimulation, showed a rate of only 6 per minute. One other subject showed a few questionable contractions, which were, however, inadequate

for counting. In the other cases there was no peristaltic response in this area. The local mucosal reaction was in every respect identical with that produced within the rectum. (See Plate 1*c*).

In 3 cases oil of turpentine was applied locally. A small area of injection was consistently produced, with disappearance of the venular markings. Although this area was somewhat shiny, the exudative, glairy surface seen after the application of salt was absent. In 2 of the 3 subjects stimulation within the rectum produced peristaltic contractions at about the same rate as those produced by salt solution (Fig. 1). In the third case there was no

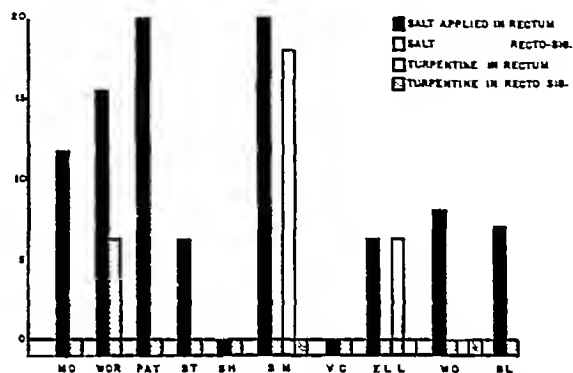


Figure 1. Differential Irritability of Rectum and Rectosigmoid. Each set of parallel columns represents one subject. The ordinate represents the number of contractions per minute produced by local stimulation with an irritant which was applied in each instance for two periods of thirty seconds each. Note that in only one instance was any rhythmic activity set up by stimulation above the rectosigmoid valve. Stimulation below this point quite frequently produced reflex contractions.

peristalsis. In none of the 3 was there any spasm of the rectosigmoid sphincter. When turpentine was applied in the rectosigmoid the usual local mucosal response occurred, but there was no peristaltic activity whatever, and no spasm.

The effect of *epinephrine hydrochloride* in 0.1 per cent solution was investigated in 2 cases. In each it was applied locally twice, for thirty seconds each time. In both instances a local blanched area with a slightly glossy surface was produced. In one of these the application was made in the ampulla of the rectum and was followed by the onset of active peristalsis. In the other it was applied in the rectosigmoid, from which point an acute sharp pain was referred to the umbilicus, but no peristaltic activity ensued.

*Benzedrine sulfate** was applied locally in only 1 control subject, and in a 0.5 per cent concentration was utterly inert. It was also employed in 2 patients with established "mucous colitis," but was

without effect in relieving spasm or in altering the mucosal picture. Its effect upon the x-ray picture when given in large doses by mouth has been demonstrated by Myerson and Ritvo¹⁰. In our experience, doses of 20 or 30 mg given orally failed to produce immediate relaxation in several patients with "mucous colitis." Prolonged oral administration, however, yielded symptomatic relief.

Atropine sulfate, in solutions varying in strength from 0.1 to 0.6 per cent, was applied locally in 12 cases in which spasm was present. Occasionally a moderate degree of spasm of the rectosigmoid valve was found at the time of the initial observation, it was probably due to emotional factors, which are discussed below. Under these circumstances atropine was applied in 4 cases. A 0.1 per cent solution relaxed the sphincter in one case and failed to do so in a second, a 0.3 per cent solution produced relaxation in a third, while in a fourth, a 0.5 per cent solution not only failed to relax the sphincter but in addition produced symptoms of toxicity. In 3 cases, atropine sulfate solutions of strengths varying between 0.1 and 0.6 per cent were at least partially effective in relieving spasm produced by cholinergic drugs. In 5 patients with "mucous colitis," atropine solutions, in concentrations from 0.2 to 0.5 per cent, were successful in 1 case, partially successful in 2, and utterly inert in the remaining 2.

Acetyl-β-methylcholine chloride^{17*} in 1 per cent solution, when applied locally in the rectal ampulla, was found in 10 cases to produce a small circumscribed area of injection in all respects similar to that produced by hypertonic saline solution, it had, however, no more dramatic or sustained effect than the latter. In a few cases there occurred peristaltic activity, which was entirely comparable with that produced by saline solution.

Pilocarpine hydrochloride in 1 per cent solution was found to produce very dramatic effects when locally administered in 10 normal subjects. These changes consisted in an immediate bluish-red, almost magenta, injection with a brilliantly glairy mucoid surface. Simultaneously with these changes there appeared a fine wrinkling of the surface of the mucosa, followed by gradual invagination into overlapping folds of tissue. Within five minutes these folds met in the center of the lumen, completely obstructing it with "a squirming spasm." These changes are illustrated in Plate 1d. A graphic representation of the changes following the administration of pilocarpine as well as of other drugs is given in Figure 2, this shows the consistency of the findings throughout the entire group of subjects.

Physostigmine sulfate in 0.5 to 1.0 per cent solu-

tion was found to produce equally dramatic although less rapid changes, which were consistently demonstrated in the 8 subjects studied. Subsequent to its application (two times for thirty seconds each) the first change occurred in about three to five minutes, when there was a cloudy, diffuse mucosal swelling (Plate 1e). The surface was glossy, but injection was usually less prominent than pallor. In some instances there appeared central pallor, with injection about the edges or in traumatized areas. A coarse wrinkling of the surface then developed, and heavy invaginated folds gradually formed. In ten to fifteen minutes they met in the midline and produced the picture of complete spasms illustrated in Plate 1f.

Acetyl-β-methylcholine chloride was administered by mouth to 10 subjects. In 3 of them (M.O., P.A.T., W.O.R.) 200 mg was given two hours before the sigmoidoscopic examination. In the other 7 subjects repeated large doses (1000 mg per day) were given over a longer period of time, and examinations were performed on the mornings of the second and fifth days. In some cases, still larger doses, up to 3000 mg daily, were subsequently given, but the changes produced were not substantially greater.

In all cases definite mucosal changes took place, these are graphically represented in Figure 2. The changes illustrated in Plate 1g are those present in one of the more stable subjects. In general, the changes produced by orally administered acetyl-β-methylcholine chloride consisted in a bluish-red injection most marked between the middle and upper rectal valves. In this area the veins were usually obscured, although they tended to be prominent below the middle and above the upper valves. The surface of the mucosa was finely wrinkled, with the ridges pointing in all directions. This surface was shiny but not glairy. In general, the caliber of the rectum and rectosigmoid was somewhat reduced, although real occluding spasm was present in only 2 cases.

Subjective symptoms were produced in all the patients who took the drug over a period of days, and in 1 who had but a single dose. Five of the men suffered from a tendency toward diarrhea, 1 having associated severe abdominal cramps and 2 uncomfortable low-back pain. Three of the remaining subjects had definite constipation. The other 2, who had only single doses, were symptom free.

Carbaminoylcholine chloride^{18†} in doses of 0.012 and 0.024 mg daily, was administered by mouth to 2 subjects. The changes produced were essentially the same as those produced by acetyl-β-methylcholine chloride, and consisted of diffuse injection principally between the middle and upper valves,

*Furnished in the form of Mecholyl through the kindness of Merck and Company, Rahway, New Jersey.

†Furnished in the form of Doryl through the kindness of Dr. Isaac Starr, Jr., Philadelphia, and Merck and Co., Rahway, New Jersey.

prominence of veins in the non-injected areas, a finely wrinkled, glossy surface, and reduction in caliber. The subject who received 0024 mg daily complained of diarrhea similar to that from which he had suffered after taking acetyl- β -methylcholine chloride. The other subject developed no symp-

was made as to the presence or absence of a simultaneous facial blush.

The degree of difference between the initial observation and characteristic subsequent observations, at the moment of introduction of the sigmoidoscope, is graphically recorded in Figure 2.

DISCUSSION

The changes produced in the mucosa of the rectosigmoid by the administration of cholinergic drugs are akin to those seen in that vague group of disorders best recognized under the term "mucous colitis." Recognized from antiquity, this group of patients was particularly studied by Da Costa¹⁰ in this country and by the dynamically minded European clinicians of the late nineteenth and early twentieth centuries, Nothnagel,²⁰ Von Noorden,²¹ Ewald²² and others.

The clinical picture of the "mucous colitis" syndrome consists of abdominal pain, usually felt below the umbilicus, and usually related to the ingestion of food or to defecation. Constipated or loose stools of small caliber are generally present and in many cases are streaked with mucus. In some cases there is a generalized abdominal tenderness, most acute in the left lower quadrant, where the sigmoid is usually palpable as a tender, firm mass. In others there are circumscribed attacks of severe colic followed by the passage of long strings of mucus, alternating with periods of comparative comfort. The course of the disease is protracted, with frequent exacerbations and remissions. It usually occurs in tense, nervous persons.

Singer's¹⁰ early description of the rectal and sigmoidoscopic findings in this condition was somewhat amplified by Friedenwald, Feldman, and Rosenthal,¹¹ who described three stages in its development.

- 1 Engorgement of vessels, dilation of capillaries, mucous membrane covered with glairy mucus giving a shad-roe appearance.

- 2 Vessels no longer standing out, glairiness gone, but distinct patches of tenuous mucus present, surface injected.

- 3 Mucous membrane thinned out, pale, covered with dry mucus, pinhead ulcerations seen when mucus is removed.

In any stage spasm may be present to such a degree as to render the passage of the sigmoidoscope painful. The sigmoidoscopic examination of a patient with mucous colitis is reproduced in Plate 1*h*. The disappearance of vascular prominence, the generalized injection, the absence of glairiness and the presence of patches of tenuous mucus are characteristic of the second stage described by Friedenwald, Feldman and Rosenthal.

Among the early workers to describe the x-ray

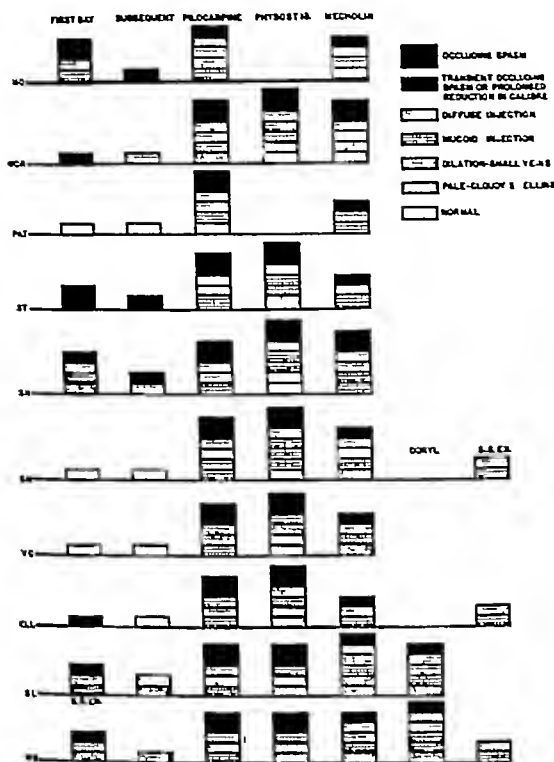


Figure 2 Schematic Description of Mucosal Appearance. Note consistent changes produced by pilocarpine hydrochloride and physostigmine sulfate locally and by acetyl β methylcholine chloride and carbanisoylcholine chloride orally, also the lesser changes produced by soap-suds enemas. Some of the subjects showed changes at the first examination which tended to disappear subsequently. These were attributed to unwarranted apprehension.

toms at all. A graphic representation of the observed mucosal changes is given in Figure 2.

CHANGES NOTED DURING EMOTIONAL STRESS

In the course of these observations it became apparent that a number of the subjects approached their initial examination with a degree of apprehension subsequently proved unwarranted. In tabulating the data it was also noted that in 6 of the 10 subjects the original description of the initial examination revealed changes which were not present to the same degree at the time of introducing the sigmoidoscope on subsequent occasions. In one instance the hospital artist, a woman, noticed a distinct injection of the mucosa when she first examined the subject, in the course of a few minutes it had largely disappeared. No observation

changes in "mucous colitis" were Singer and Holzknecht,²³ who called attention to the characteristically reduced caliber of the lower colon. Schwartz²⁴ again called attention to the reduced caliber of the descending colon and sigmoid, and noticed very sudden occurrence and relaxation of spasm. Discovery of the "string sign," a fine, tenuous shadow supposedly produced by a mixture of barium and mucus in the spastic descending colon, is generally attributed to Crane,²⁵ while Kantor²⁶ made observations on the rapid rate of movement of colonic contents in this condition. Knothe⁹ applied the barium relief technic to the problem and described a finely wrinkled sigmoid. Von Bergmann and Kutsch²⁷ were successful in demonstrating changes in the caliber of the entire colon in normal individuals following the administration of atropine and pilocarpine—relaxation after the former, marked degrees of spasm after the latter. This observation was a definite contribution to the physiology of the colon, particularly as it is altered in mucous colitis. However, the x-ray findings in the disease have been shown to be extremely inconstant. Spasm, the most constant characteristic reported by Friedenwald, Feldman and Rosenthal,¹¹ was present in only 51 per cent of the cases, while they reported sigmoidoscopic changes in 89 per cent of 438 cases so examined. The sigmoidoscopic examination in their experience would seem to be of greater significance both theoretically and practically than examination by x-ray. Similarly, the experimental production of mucosal changes by the administration of cholinergic drugs as indicated in the above data seems of greater significance than the production of x-ray changes in tending to confirm the general belief that neurogenic, and probably psychogenic, factors play a significant role in the development of this symptom complex.

The development of constipation or of diarrhea in the subjects who were given large oral doses of acetyl- β -methylcholine chloride and carbaminoylcholine chloride, is of further interest, since these symptoms are commonly experienced in "mucous colitis." In fact, the changes produced by cholinergic drugs have been so strikingly like those seen in "mucous colitis" that we have come to believe the converse to be true, namely, that mucous colitis is the result of some form of overstimulation mediated by the parasympathetic fibers innervating the colon.

The incidental data collected on the difference in irritability of the rectal wall from that of the lower sigmoid (Fig 1) are suggestive confirmation of the theory of defecation advanced through the work of Bayliss and Starling,¹⁻³ Cannon¹³ and

Hertz,¹⁴ that is, that the passage of fecal matter from the relatively insensitive sigmoid into the more irritable ampulla is the stimulus which normally activates the defecation reflex. This increased reflex irritability is apparently unrelated to subjective pain or temperature sensation, which Hertz has shown to be absent in the normal rectum. It is probable, therefore, that in the type of constipation characterized by rectal retention,—the "dyschesia" of Hertz,—the underlying cause is, as he originally hypothesized, a diminution of the sensitivity of the rectal reflex. That this is probable is also attested by the work of Hines, Lueth and Ivy,¹⁵ who found an absence of deep rectal contractions, as measured by the manometric method, in a group of constipated hospital patients. Unfortunately, they made no effort to classify the type of constipation.

Work is now in progress to determine whether the difference in irritability between the lower sigmoid and the rectum is consistently present in a large series of cases.

SUMMARY

1 The rectal and rectosigmoid mucosa in a group of healthy, young adult males was studied with the aid of a sigmoidoscope.

2 Following the local application of certain irritants, it was noted that the rectum tended to show more reflex activity than the lower sigmoid.

3 After the local application of pilocarpine hydrochloride or physostigmine sulfate, or after the oral administration of acetyl- β -methylcholine chloride or carbaminoylcholine chloride, definite mucosal changes, simulating the sigmoidoscopic picture of "mucous colitis," were produced. All these drugs stimulate or mimic the action of the parasympathetic nervous system.

4 The response to other drugs affecting the autonomic nervous system was investigated.

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THE TREATMENT OF HAY FEVER BY INJECTIONS OF POLLEN EXTRACT EMULSIFIED IN LANOLIN AND OLIVE OIL

A Preliminary Report

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THE injection of pollen extracts into patients with hay fever is one of the most valuable measures available for the treatment of this condition. Despite many improvements in technic and methods since the introduction of this procedure there are objections to treatment with the solutions of extracts now employed. The large number of injections usually required makes the procedure costly and often inconvenient for the patient. Furthermore, general reactions which may follow an injection are disconcerting and may at times have serious consequences. If the absorption of pollen extract after injection could be made more gradual it seemed likely that many advantages would result.

Attempts have been made to diminish the rate of absorption and to prolong the effects of therapeutic agents given by injection, but with little practical success.¹ Straus,² in 1933, reported good results with the use of emulsions of diphtheria toxoid in lanolin, for immunization against diphtheria.

Studies at the Beth Israel Hospital during the last four years indicate that following the injection of certain dyes and drugs emulsified in anhydrous lanolin and olive oil, the rate of absorption of the substances is diminished and the effects of the drugs are prolonged. Similar emulsions of pollen

extracts have been used in treating patients with hay fever. These studies are reported below.

RATE OF ABSORPTION AND THERAPEUTIC EFFECT

The rates of absorption of phenolsulfonphthalein from water solution and from emulsion in lanolin and oil were compared by determining the rate of excretion of the dye in the urine after injection of each preparation. A stock solution of phenolsulfonphthalein in distilled water containing approximately 100 mg per cubic centimeter was prepared, using enough sodium hydroxide to effect solution. One part of the stock dye solution was emulsified in 5 parts of lanolin by trituration in a mortar and 4 parts of olive oil were added, resulting in an emulsion containing approximately 10 mg of phenolsulfonphthalein per cubic centimeter. A similar 1:10 dilution of the stock dye solution was made in distilled water. All ingredients were sterilized by autoclaving.

Five patients received 10 cc of each preparation of phenolsulfonphthalein intramuscularly on different days, and the hourly excretion of the dye was measured by the standards used in the renal function test. The average excretion is shown in Figure 1. After injection of the watery solution, 38 per cent was excreted in the first hour. In 4 of the 5 cases, excretion was virtually complete at the end of three hours. After the injection of the emulsion, less than 10 per cent of the dye was excreted in the first hour, and the hourly excretion

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during the next seven hours ranged between 10 and 5 per cent. Appreciable amounts of the dye still appeared in the urine eight hours after injection of the emulsion.

That an active drug emulsified in lanolin and oil exerts a more prolonged effect than does a watery solution can be shown by measuring the antidiuretic effect of pitressin when administered in each medium. The preparations compared consisted of pitressin* in water (20 units per cc) and pitressin emulsified in lanolin and oil (20 units per cc), made by emulsifying 1 part of pitressin solution (400 units per cc) in 5 parts of lanolin and 14 parts of olive oil.

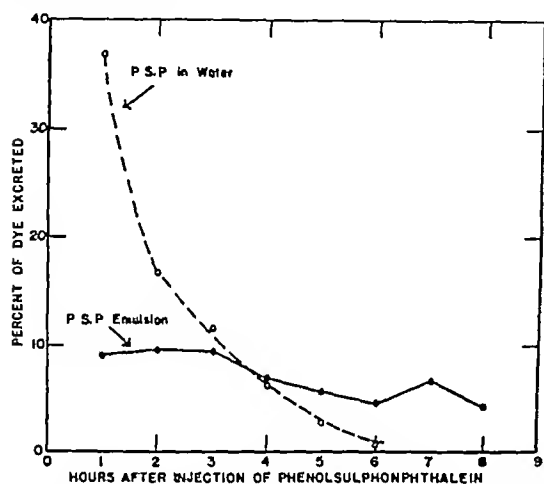


Figure 1. Average dye excretion per hour in 5 patients injected intramuscularly on different days with the same amount of phenolsulphonphthalein in water solution and in emulsion in lanolin and oil.

The daily urinary output of a twenty-nine-year-old man with idiopathic diabetes insipidus was measured under four standard conditions: (1) no treatment, (2) surgical pituitrin, 0.5 cc (10 units), given intramuscularly twice daily, (3) pitressin in water solution, 0.5 cc (10 units), given intramuscularly twice daily, (4) pitressin emulsified in lanolin and oil, 0.2 cc (4 units), given intramuscularly once daily. The effect on the urinary output is shown in Figure 2. With no treatment, the daily urinary output varied between 250 and 320 oz. The antidiuretic effect of each injection of surgical pituitrin was so temporary that the daily output was the same as during the control period. The watery solution of pitressin also caused no significant diminution in the daily urinary output. However, when pitressin emulsified in lanolin and oil was given in much smaller doses, the urinary excretion was decreased to about 60 oz, and the antidiuretic effect of each injection was maintained for at least twenty-four hours. Pitressin emulsions in 2 other

cases of diabetes insipidus showed similar prolonged effects.

METHODS

Method of Preparation. A 1:10 ragweed extract was prepared by extracting ragweed pollen with Coca's buffered solution,³ using 1 gm of pollen to 10 cc of solution. On February 27, 1937, a 1:100 pollen-extract emulsion was made by stirring 2 parts of extract into 5 parts of anhydrous lanolin until the entire solution was taken up by the lanolin, 13 parts of olive oil were then mixed in. The mixture was passed through a homogenizer* to make sure of complete emulsification, this step is not essential, however. A 1:500 emulsion was made by diluting the 1:100 emulsion with olive oil. This 1:500 emulsion was used until April 29, 1937, when a more viscous preparation of 1:500 was made by diluting the 1:100 emulsion with 25 per cent lanolin in olive oil. On July 29, 1937, a fresh 1:50 emulsion was made, using 20 cc. of an equal mixture of 1:10 pollen extract and glycerin emulsified in 30 cc. of an equal mixture of lanolin and olive oil. All ingredients and utensils were sterile.

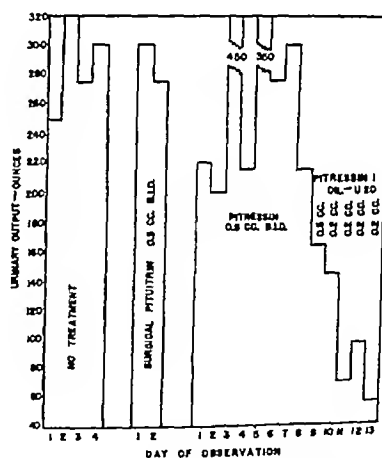


Figure 2. Daily urine excretion in ounces in a case of diabetes insipidus treated with injections of surgical pituitrin, 0.5 cc twice a day, pitressin in water, 0.5 cc twice a day and pitressin emulsified in lanolin and oil 0.5 to 0.2 cc once a day.

Selection of Cases for Treatment. Two criteria were considered in the selection of cases for treatment, (1) severity of symptoms, (2) degree of sensitivity as shown by the scratch skin test, and the local reactions after the subcutaneous injection of a small dose of ragweed extract. Only patients with moderate to severe symptoms of hay fever were accepted, 3 had asthma in addition to hay fever.

Skin tests in each case were done before treatment by the scratch test method on the forearm,

*Pitressin powder supplied by Parke Davis and Company, Detroit, Michigan.

*Portable hand homogenizer made by Club Aluminum Products Co., Chicago, Illinois.

using dilutions of ragweed extract in Coca's solution in 1 50, 1 500 and 1 5000 dilutions. The maximum reaction to each test, usually after fifteen minutes, was drawn on the record, the description including wheal and erythema, in most instances the test reactions were measured. All the cases had moderate to marked positive reactions to the 1 50 and 1 500 dilutions, and 8 had positive reactions even to the 1 5000 dilution.

Twelve patients had had from one to three subcutaneous injections of ragweed extract, 1 5000 in Coca's solution, 10 had received 0.10 cc., 1 (Case 10) had received 0.05 cc., and 1 (Case 1) had received 0.15 cc. The local reactions which had

All injections were given subcutaneously in the upper arm with a 26- or 27-gauge needle after the syringe was loaded by using an 18-gauge needle. Because local indurations may develop if injections of lanolin and oil are repeated too frequently in a small area,⁴ the sites of injection were varied. No local indurations or infections appeared after any injection given to this group of patients.

Cases 12 and 17 began treatment late and received six and five injections, respectively, before the beginning of the season, the maximum doses being 0.50 cc of 1:500 and 0.075 cc of 1:50 emulsion, respectively. In the remaining 15 cases, the

Table 1 Summary of Treatment with Ragweed Pollen Extract Emulsion

CASE No.	AGE	DURATION OF DISEASE	PRESEASONAL TREATMENT IN 1936	FIRST TREATMENT WITH RAGWEED EMULSION		MAXIMUM DOSE ADMINISTERED			NUMBER OF INJECTIONS TO ATTAIN MAXIMUM DOSE	NUMBER OF INJECTIONS UP TO AUG. 13	NUMBER OF INJECTIONS DURING RAGWEED SEASON	TOTAL NUMBER OF INJECTIONS	CLINICAL RESULTS
				DATE	DOSE OF 1:500 DIL.	DATE	DIL.	CC.					
1	37	37		1937	cc	1937	dil	cc					
2	38	15	0	4/12	0.15	6/21	1:100	0.50	9	12	1	13	Good
3	16	3	0	3/29	0.10	8/6	1:50	0.50	11	13	0	13	Excellent
4	16	3	0	3/29	0.10	7/11	1:100	0.50	10	12	1	13	Good
5	25	2	0	4/12	0.10	6/18	1:100	0.50	8	11	1	12	Good
6	23	4	Sol	4/23	0.10	6/18	1:100	0.50	8	12	1	13	Good
7	15	2	0	4/23	0.10	6/28	1:100	0.50	9	12	0	12	Excellent
8	59	33	Sol	4/26	0.10	8/9	1:50	0.40	8	10	0	10	Good
9	42	15	Emul.	4/30	0.10	8/9	1:50	0.50	9	11	3	14	Good
10	42	6	0	5/10	0.10	8/9	1:50	0.20	12	13	4	17	Good
11	22	5	Sol	5/10	0.10	8/2	1:50	0.25	10	11	1	12	Excellent
12	31	2	0	7/26	0.10	8/6	1:50	0.35	9	12	0	12	Excellent
13	25	3	Sol	4/26	0.10	8/13	1:500	0.50	6	6	2	8	Fair
14	19	15	Emul.	6/4	0.10	8/13	1:50	0.45	10	10	1	11	Good
15	45	12	0	6/11	0.05	8/9	1:50	0.20	8	8	3	11	Good
16	16	2	0	7/2	0.10	7/20	1:50	0.25	7	10	1	11	Good
17	17	7	0	7/2	0.10	8/6	1:50	0.45	10	11	0	11	Excellent
				7/26	0.10	8/9	1:50	0.075	5	5	1	6	Fair

* Asthma in addition to hay fever

developed were large in 6 patients (Cases 2, 5, 6, 10, 16 and 17), moderate in 2 (Cases 1 and 15), and small in 4 (Cases 3, 4, 11 and 13). One patient (Case 7) had had no reaction with 0.10 cc. of 1:1000 ragweed extract.

Method of Treatment The initial dose was 0.10 cc of 1:500 emulsion with the exception of 2 cases which began with 0.15 cc. (Case 1) and 0.05 cc. (Case 14). The subsequent doses were increased at weekly intervals according to the local reactions until the maximum dose was reached. If this amount was reached long before mid-August, as in cases started on treatment early in the year, the maximum dose was repeated at intervals of two to four weeks. Four patients (Cases 12, 15, 16 and 17) who began treatment in July were given two injections a week until the beginning of the ragweed season, about August 13. Up to July 29, the maximum dose was 0.50 cc. of the 1:100 preparation. This was made on February 27, and since it was five months old and had possibly deteriorated, a fresh 1:50 emulsion was made on July 29, which was used with some patients, the maximum dose being 0.50 cc.

maximum dose varied between 0.20 and 0.50 cc of 1:50 emulsion or its equivalent (Table 1). The number of injections given to attain this maximum varied between seven and twelve, with an average of nine. The maximum dose was repeated at increased intervals with many of the patients until the beginning of the ragweed season. In some cases, doses following the maximum were reduced because of a large local reaction, or because of the approach of the season.

The season is considered to extend to the end of September. The doses given during the season were less than the maximum dose reached before it began.

RESULTS

Local and General Reactions To determine whether pollen-extract emulsion was more slowly absorbed than the solution in water, 10 patients were injected at the same time with a 1:5000 solution into one arm and a 1:500 emulsion into the other. The amount usually injected was 0.10 cc. The size of the reaction produced by each injection was observed up to one hour. Invariably, the

emulsion produced a smaller immediate local reaction than the solution, even though it contained ten times the amount of pollen extract. After several hours, however, the local reaction from the emulsion approached that from the solution, and often became larger and lasted longer. This indicates that absorption of the pollen extract from the emulsion was delayed.

Three patients had general reactions. In Case 14 the patient received 0.10 cc of 1:50 emulsion on August 2 and 0.20 cc on August 9. Five minutes after the last injection he developed a large local reaction, accompanied by wheezing. He responded quickly to 0.50 cc of 1:1000 adrenalin, and no tourniquet was necessary. In Case 15 the patient received 0.35 cc of 1:100 emulsion on July 23. A week later he was given 0.25 cc of 1:50 emulsion, and about five minutes later developed wheezing which did not require treatment. The following day the local reaction was "larger than usual." In Case 17 the patient received 0.50 cc of 1:500 emulsion on August 6. Three days later she was given 0.075 cc of 1:50 emulsion. About thirty minutes after injection, while on her way home, she developed a large local reaction and a "wheezy feeling" which persisted until the next day. She did not call a physician.

All three of these general reactions occurred after the patients had been given a freshly made 1:50 preparation, the preceding injections having consisted of material five months old which had probably deteriorated to some degree. The reactions were mild, and did not resemble the acute, dramatic, general reactions occasionally seen with the usual ragweed solutions.

Effect on Skin Reactions. Each case was skin-tested before treatment. At intervals thereafter the scratch tests were repeated and changes were noted. In every instance there was a striking progressive diminution in the size of the reaction. Before treatment, every patient showed moderate to marked reactions to the 1:50 and 1:500 dilutions, and 8 showed slight to moderate reactions to the 1:5000 dilution. After treatment, no patient reacted to the 1:5000 dilution, 5 showed questionable to slight reactions to the 1:500 dilution and 12 showed negative ones, 13 showed slight to moderate reactions to the 1:50 dilution and 4 showed virtually negative ones. For example, the patient in Case 10, who gave the most pronounced reaction to the skin test before treatment, showed the following wheals on repeated testing:

		1:50 DIL.	1:500 DIL.	1:5000 DIL.
		mm	mm	
Before treatment	April 30	55 x 38	38 x 14	Small
	August 16	8 x 8	None	None
After treatment	October 18	6 x 6	None	None

The patient in Case 17, who had the smallest number of injections, showed the following wheals:

		1:50 DIL.	1:500 DIL.	1:5000 DIL.
		mm	mm	
Before treatment	July 26	18 x 18	5 x 5	None
After treatment	August 16	10 x 10	None	None

To determine whether the tolerance to ragweed extract was increased by treatment with emulsion, 8 patients after reaching a dose of 0.40 or 0.50 cc of 1:100 emulsion were injected with 0.10 cc of 1:100 ragweed solution. The reactions produced ranged from negative to very slight.

Clinical Results. The evaluation of results in the treatment of hay fever is difficult. After treatment, one patient may have more symptoms than another, yet show more improvement. Also, some patients complain more than do others whose symptoms are more severe. With these considerations in mind, the patients have been grouped according to clinical results in three arbitrary divisions.

Excellent Results. This group comprises 5 patients (Cases 2, 6, 10, 11 and 16) who had no days of discomfort during the entire season. On close questioning, they admitted that on arising they occasionally had some stuffiness in the nose and slight sneezing which lasted only a short time, with no discomfort during the remainder of the day or night. No symptomatic treatment was required in this group. Four patients had no injections after the season started and 1 (Case 10) had one.

Good Results. This group includes 10 patients (Cases 1, 3, 4, 5, 7, 8, 9, 13, 14 and 15) who had mild symptoms of hay fever during the day on four or five occasions during the season, but did not require active symptomatic treatment. In comparison with years in which they had had no treatment, the degree of relief was marked. No patient was incapacitated at any time. The 3 patients who had asthma in addition to hay fever had much less discomfort than in other years, and the wheezing was readily controlled by ephedrine sulfate, 3/8 gr. Only 3 of the 10 patients received more than one injection during the season.

Fair Results. Two patients (Cases 12 and 17) who reported for treatment late in July, and received only six and five injections, respectively, before the onset of the season, had more symptoms than the other patients in this series. They were, however, definitely better than in previous years in which they had received no treatment.

DISCUSSION

Microscopic examination of an emulsion of water in lanolin and oil shows the watery phase as minute droplets surrounded by lanolin and oil. When such an emulsion is injected, each droplet must be

liberated from its envelope before it can come in contact with the tissues and be absorbed. The same amount of water if not emulsified can be absorbed much more quickly, as shown by a comparison of phenolsulfonphthalein excretion from solution and from emulsion (Fig 1). In the same way, an active drug when emulsified has a prolonged absorption and prolonged action. As indicated in Figure 2, 4 units of emulsified pitressin once a day had a prolonged antidiuretic effect sufficient to control a case of diabetes insipidus for at least twenty-four hours, whereas 10 units in solution given twice a day had so temporary an effect that the twenty-four-hour urinary excretion was the same as when no treatment was given. This technique has been applied to other active drugs.⁴ Several patients with bronchial asthma have had longer periods of relief between attacks when emulsified adrenalin was used than when adrenalin in 1:1000 solution was given. In fasting rabbits, emulsified insulin produced hypoglycemia lasting eight hours or more as compared with three hours when the same amount of insulin was given in solution.

Delay in the absorption of emulsified pollen extract is indicated by the fact that milder immediate local reactions were produced by injections of emulsified extract than by those of watery solutions, even when the amount of extract in the emulsion was ten to twenty times as great as that in the solution. The value of this method of delayed absorption in the treatment of hay fever may be determined by comparing the results in this series with those obtained by treatment with extracts usually used. When pollen extract in water solution is injected into a sensitive patient, the entire amount comes into immediate contact with the antibodies in the tissues and the maximum reaction starts immediately. With emulsion, however, only part of the extract comes into immediate contact with the antibodies, the remainder being slowly released. Because of this, a larger amount of pollen extract may be given in emulsion. The patients in this series were all started on treatment with a 1:500 dilution, whereas the usual initial dose of pollen extract in patients with the degree of sensitivity manifest in this group is a 1:5000 or weaker dilution.^{2, 5, 6} Since larger doses may be given, a specified maximum dose can be reached with fewer injections. The maximum dose aimed at is usually 0.50 cc of a 1:100 or 1:50 dilution of extract, requiring from fifteen to twenty-five injections of the extract in solution. This dose was reached in this series by from seven to twelve injections of emulsified extract with an average of nine, approximately half the number usually required. Furthermore, if the data in 4 cases treated in 1936 with ragweed solution and in 1937 with

emulsion (Table 2) are compared, it is evident that fewer injections of emulsion resulted in a

Table 2. *Comparison of Treatment and of Results in 4 Cases of Ragweed Hay Fever Treated in 1936 with Ragweed Extract in Solution and in 1937 with Ragweed Extract in Emulsion*

CASE No	TREATMENT	MAXIMUM DOSE		NUMBER OF INJECTIONS	CLINICAL RESULTS
		dil	cc		
5	Sol	1:500	0.40	11	Poor
	Emul	1:100	0.50	8	Good
7	Sol	1:100	0.70	16	Good
	Emul	1:50	0.40	5	Good
11	Sol	1:100	0.25	19	Poor
	Emul	1:50	0.55	9	Excellent
13	Sol	1:100	0.05	9	—
	Emul	1:50	0.45	10	Good

This patient received no injections between July 24 and September 4 1936 so that the results obtained in that year are not considered comparable.

higher maximum dose. The decrease in the number of injections reduces the expense and inconvenience to the patient, so that more patients with hay fever will find it possible to take treatment. Since the time necessary for preseasonal treatment is shortened, patients starting treatment late have more chance of getting good results. In cases reporting after the onset of the season, it is also possible that treatment with emulsions may be more effective than treatment with watery solutions. In using emulsions of lanolin and oil, care must be exercised to avoid injecting too frequently into the same area. Several patients who injected themselves at home with pitressin or adrenalin emulsions developed temporary local indurations which were apparently due to neglect of this precaution. A few instances of minor local infection also occurred after self-administered emulsions. No injection of emulsion given by us has caused any local complications, and none were encountered in this series. The injections are painless except for the needle puncture.

The effect on the sensitivity as indicated by skin tests is of interest. The ability of treatment with pollen extracts to affect the skin sensitivity has been open to question, a definite decrease in the size of skin tests as determined by the scratch method, however, has been demonstrated in some cases following treatment.⁷ All the patients in this series showed marked reduction in the size of the skin tests. It seems likely that the slow absorption from emulsion permits the extract to act over a longer period of time, and thereby to serve as a better desensitizing agent, than is the case with the extract in solution. It is possible, therefore, that this method may result in a higher percentage of cures than that now obtained. Also, the greater desensitization may make it possible to increase the intervals between injections in the perennial form of treatment.

The danger of general reactions is everpresent, and may have serious consequences.⁸ To avoid these severe immediate anaphylactic reactions, the application of a tourniquet proximal to the site of the injection and the addition of adrenalin to the pollen extract have been advised, in order to delay the absorption of the pollen.⁹ These precautions are not sufficiently observed, unfortunately, because of their inconvenience. Although adrenalin may slow the absorption of pollen extract from the site of injection, the entire amount of pollen does come in immediate contact with the tissues, and if the reaction is violent enough, a general reaction may occur. With the use of emulsions, where only a part of the pollen extract reaches the tissues at any one time, it is reasonable to suppose that the tendency to severe general reactions will be greatly reduced, especially if the methods now advised are used.

The clinical results obtained in these cases were very satisfactory. There were no failures in treatment, even the 2 patients whose treatments started late and who received only five or six injections had at least fair results. Of the remaining cases, 5 had excellent results and 10 good results. There is reason to believe an even higher percentage of excellent results may be obtained by larger dosage and more treatment during the pollen season. The results compare favorably with those obtained from the usual treatment with solutions,^{3, 6, 6} and in the cases of this series which were treated in 1936 with solutions, the results with emulsions were definitely better.

The advantages of pollen-extract emulsions as compared with the solutions now used seem apparent, and the findings in this series are significant. The results warrant a more general application of this method.

SUMMARY AND CONCLUSIONS

A method is described for emulsifying water solutions of drugs in anhydrous lanolin and olive oil. Evidence is presented that such drugs when injected are more slowly absorbed, have a more prolonged action, and are therefore more effective than when administered in water solution without emulsification. Emulsions of ragweed pollen extract were utilized in the preseasonal treatment of 17 patients with moderate to severe symptoms of hay fever and moderate to marked sensitivity to ragweed pollen.

In comparison with the treatment of such patients by pollen extracts in solution as now used, certain advantages of the emulsions are apparent.

1 Pollen extracts in emulsion are more slowly absorbed. Ten times as much pollen extract in emulsion produced less immediate local reaction than the solution.

2 Larger doses may be given. The patients in this series received an initial dose approximately ten times as great as usual.

3 The number of injections necessary to reach the usual maximum dose of 0.50 cc. of a 1:100 or 1:50 dilution is reduced. This dose was reached in an average of nine injections, about half the number usually required with the solutions now in general use.

4 Sensitivity as indicated by skin tests is markedly reduced.

5 The tendency to severe general reactions is decreased because of the slow absorption of the extract.

6 The clinical results are as good or better with the extract in emulsion than with the extract in solution. There were no failures. Two patients who started treatment late and failed to reach the usual maximum dose had fair results. Of the remainder, 10 had good results, and 5 had excellent results.

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THE ADRENOGENITAL SYNDROME AND ADRENOCORTICAL TUMORS

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DYSFUNCTIONS of endocrine glands produce, at times, changes in metabolism and in physical characteristics. Certain such changes belonging in the sexual sphere have been described as the adrenogenital syndrome, and have been shown to be caused in some cases by a tumor in the adrenal cortex. On the other hand, tumors of the adrenal cortex have occurred without producing any recognized endocrine change. Again somewhat similar syndromes have developed with tumors of other glands,—the pituitary, pineal, thymus, testis or ovary,—or without demonstrable glandular tumors. So that the only information as yet available relates to part of the mechanics involved in the dysfunction.

There have been under observation since 1927 at the Squier Clinic 35 cases of adrenocortical disturbances, 8 male and 27 female. Some showed syndromes due to adrenal tumors, but in others no such tumor could be proved. Certain other cases had adrenal tumors but no endocrine dysfunction. A discussion of this complex problem as seen in this series may be of interest.

SYMPTOMS

Corticoadrenal tumors may exist with or without the adrenogenital syndrome. When the syndrome is present the endocrine changes appear to follow three more or less separate paths. The most frequent change is the development of the secondary sexual characteristics of adult masculinity, and is best termed androtropic; secondly, evidences of maturity may occur in the young and those of an even more advanced age in the mature; thirdly, there may be changes in metabolism affecting mostly the plasma, the fat distribution, the skin and the psychologic balance. The symptoms of this syndrome vary according to the sex and age of the patient and the degree of malignancy of the tumor. Since similar syndromes occur without demonstrable tumor, a review of the symptoms, with a discussion of their divergence in tumor and non-tumor cases, may give the clearest picture that can be shown at present in these unusual clinical states.

When the tumor occurs in the male before

puberty, precocious sex development is the most frequent symptom. Associated with this phenomenon there is an increase in muscular development which produces in some individuals the so-called Herculean type. This condition, according to Harris and Plewes,¹ characterizes over 60 per cent of the collected cases. There is often a proportionate increase in athletic ability. In addition, a premature growth of hair occurs on the genitals, face, body and extremities, and the hair is frequently coarse and dark. The genitals enlarge and become adult in type. Coinciding with this precocious development, substances with male hormone properties appear in the urine, although according to Womack and Koch² most boys under ten do not excrete demonstrable amounts of male hormone. Rapid growth takes place but is followed by cartilage loss with cessation of growth, so that the subject may actually become much shorter than children of the same age. The dentition is advanced. A certain number of subjects develop obesity, most marked in the face and trunk, and redness of the face. Skin changes such as acne occur as at puberty. Precocious tastes and appetites, including sexual desire, may develop. Frequently, children show mental development beyond the age index.

Similar endocrine changes, described as macrogenitosomia praecox, have occurred with tumors of the pineal gland. An interesting group of cases with similar sexual symptoms without evidence of tumor, occurring in one family, was classified by Rush and his co-workers³ as primary, primary constitutional, or congenital pubertas praecox. He believed that such a condition was determined genetically. We studied 4 male children with macrogenitosomia praecox. The first child, aged five, with premature puberty, showed no abnormal change in his pineal, pituitary, thymus, gonadal or adrenal glands by x-ray or otherwise, so that a cause for the endocrine abnormality could not be demonstrated. The second boy, aged seven, was sexually mature and had the height and weight of an eleven-year-old. There were also epiphyseal changes corresponding to those of twelve or over. There were no changes from normal in the pineal gland, pituitary, thymus and gonads. Air injection and x-ray revealed a left adrenal gland enlarged to about one third the size of the kidney, and an apparently normal one on the right. This enlarge-

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ment is suggestive of increased adrenocortical function as the cause of sexual maturity, and implies the presence of male hormone in the urine, but whether the latter is due to hyperplasia or tumor of the gland awaits operative confirmation. The third boy, aged eleven, previously described,⁴ had marked hirsutism and hypertrophy of the genitals. The early fusion of the epiphyses, with apparent shortening of the extremities, and the continued facial and muscular growth suggested an achondrodystrophic dwarf. At the time of this boy's hospitalization we were able to show the presence of female hormones in his urine, but no facilities were then available for determining the excretion of male hormone. Air injection and x-rays of the adrenals showed a change in one which indicated hypertrophy or tumor, but the mother's failure to co-operate prevented further study. The long standing symptoms, seven or eight years in duration, with the only demonstrable anatomic glandular changes in one of the adrenals, suggest an adenoma or hyperplasia of the cortex as the causative agent. In the fourth case, also a boy of eleven, the symptoms had been present since infancy, again suggesting an achondrodystrophic dwarf with marked hirsutism and hypertrophied genitals. Although this case closely resembled the foregoing one, x-ray studies disclosed no anatomic changes in the endocrine glands. In neither of these cases was there any evidence of a hereditary or familial occurrence.

Thus of the 4 male children with adrenogenital syndrome, 2 showed anatomic adrenal changes that were suggestive of but not operatively proved to be the cause of the symptoms, while in the other 2 the syndrome had existed for relatively long periods without any causative anatomic glandular change's being demonstrable.

In the male after puberty, adrenocortical tumors have occurred without producing any endocrine changes (Hartman,⁵ Stevens,⁶ Gibson⁷ and others). Such a case was previously described¹ in which autopsy revealed a carcinoma of the right adrenal cortex with extensive metastases. A second patient, a male of thirty-six, was without symptoms except for pain in his left flank. A tumor of the left adrenal was shown by air injection and x-ray. On removal it was found to have arisen from the lower portion of the adrenal and to have grown in front of the kidney, without causing its displacement. Microscopic section showed that the tumor was derived from the adrenal cortex, but it was impossible to tell from which cell structure.

Adult males with adrenocortical tumors and evident endocrine changes have been reported. Macera⁸ described a case with adiposity, polydipsia, hypertrophy of the genitals, changes of metabolism

and increase of secondary male sexual characteristics. Long and Gray⁹ reported an adrenocortical tumor in a male acromegalic. However, such changes as occur have been mostly toward feminization, best termed gynecotropic. Among such cases Weber¹⁰ cited 2 from the literature with hypertrophy of the mammae and atrophy of the testes, both having adrenocortical tumors. More recently Holl¹¹ and Lisser¹² have each described cases of feminization of the male with such tumors. One male adult in our series had obesity, atrophy of the genitals, and a marked increase in hair. Besides the decrease in the size of the testes, the only demonstrable glandular change was an enlargement of both adrenals, shown clearly by air injection and x-ray. No operative procedures to establish the cause of the adrenal hypertrophy were permitted, and no hormonal studies were made.

In the female, when the disease occurs before birth or in early infancy, only cases of tumor with definite hormonal changes have been reported, and the symptoms have been best described as pseudo-hermaphroditic. It has been suggested that all cases of pseudo-hermaphroditism are the result of hypersecretion of the adrenal cortex. Yet the only adrenal lesions known to produce such changes are cortical tumors. Young¹³ has most interestingly described his experiences in correcting these defects, and has discussed their association with adrenal changes. The contention that such changes occurring in the secondary sex organs are due to hormonal influences, possibly apart from tumor, has received much support from the experimental work of Hain,¹⁴ who has shown that hypospadias in the female offspring of the rat may be produced by the injection of the female sex hormone (estrone) before or immediately after birth. Moreover, Greene and Ivy¹⁵ have demonstrated that male sex hormone (testosterone) when injected early in pregnancy in rats produces an arrest in the development of the vagina and a hypertrophy of the clitoris to the point of resembling a penis, or results in intersexuality (freemartin). If a tumor develops in the female before puberty and is highly malignant, death may occur before any marked changes take place. Usually the characteristic tendency toward adult masculinity is noted. This is first shown by hair growth which is masculine in its distribution. The genitals change, the clitoris increasing in size until it resembles a penis. The labia majora enlarge and become deep red. These patients, as a rule, do not menstruate even though the age of puberty has been reached. Two exceptions have been reported (Bulloch and Sequeira,¹⁶ and Cecil¹⁷). The voice is often deep and husky. Complete dentition and union of the

epiphyses occur, as in the syndrome in male children. There may be obesity of the face, neck and trunk, with an increase in the size of the mammary glands. The skin may become coarse and dry and acne may develop.

In the female after puberty and before the menopause, symptoms of the adrenogenital syndrome are more frequent—27 of our 35 cases were in this category. Of these, only 6 had proved tumors of the adrenal cortex. Adrenocortical tumors may also occur without any endocrine syndrome in the female, as shown by 1 of our patients who had a tumor on the left side, with cells mostly resembling the zona fasciculata. The changes produced tend toward the secondary sex characteristics of masculinity (androtropic). More rapid aging and metabolic changes of plasma, fat and skin which are similar to those described in younger females, take place. These androtropic changes are accompanied by a suppression of the female characteristics. The first symptoms are amenorrhea and hirsutism. At the beginning there may have been scanty menstruation, followed by its complete cessation, lasting until the tumor is removed. Headaches have frequently occurred at the time when menstruation should have taken place. Associated with the absence of menstruation there is often complete loss of sexual desire and libido. Homosexual desires have been reported by Holmes,¹⁷ with a return to normal after removal of the tumor. All our tumor cases had little or no sex thoughts, and none exhibited any homosexual trend. The menses in these cases started after the tumors were removed, sex attraction and libido returning at the same time. In 1 case metastases developed later and the menses again ceased, as did the libido.

Increase in hair or hirsutism occurred early. The pubic escutcheon became masculine in shape, and hair appeared on the face, chest, back and extremities. The hair was black and coarse, except in 1 case. A loss of head hair was also noted, 1 woman becoming bald. The growth of hair on the body may become extraordinarily profuse, especially about the genitals. On removal of the tumor the hair falls out, chiefly at the time of menstruation and frequently while bathing. In women who have shaved, the loss of hair on the face has been disappointingly slow after operation. One woman was still shaving every other day three years after removal of the tumor.

The changes in the sex organs are more marked the younger the subject. The clitoris may resemble a penis, and the labia majora become hypertrophied and reddened. In older women there has been a definite loss of ovarian tenderness on pelvic examination. At operation in all the tumor

cases, the ovaries have been extremely small and the uterus has been smaller than normal. In young subjects the breasts may resemble a boy's, but female development follows removal of the tumor. In older subjects there may be a reduction in size, with a return to normal after operation. The voice becomes deeper and more masculine the earlier the disease occurs in youth. This has been shown to be due to a marked increase in the length of the vocal cords.

With masculinization, rapid maturity, with cessation of growth and absorption of the epiphyseal cartilages, occurs in younger individuals. Older people appear to be of more advanced age than is the case. Apparently these women are not fertile during the symptomatic period of the disease, although 2 had had children before the onset of symptoms. Marked sexual changes in 1 case were not accompanied by any pronounced changes in the metabolism of plasma, fat deposits or the skin.

Metabolic changes associated with the masculinization of the individual take place more frequently, although cases have been seen in which the latter was slight and the former were marked. With these changes the skin becomes dry and coarse, and acne frequently develops. Redness and duskeness of the face and hands were marked in 2 cases. Both patients had polycythemia, one with a red-cell count of 5,700,000 and the other with one of 6,300,000, and each with a hemoglobin of 125 per cent. In 1 case the total blood volume was about 50 per cent of normal. Similar duskeness with increased red-cell counts has been described in cases of Cushing's basophilic adenoma of the pituitary, but no records of blood volume have been made. The paralleling of the symptoms and blood changes suggests that the basic mechanics of the plasma changes in these conditions may be somewhat the same, since in Cushing's syndrome additional adrenal changes have frequently been found at autopsy. Pigmentation may take place. Striae atrophicæ of the skin of the abdomen and thighs, similar to that described in Cushing's syndrome, also occur. Obesity is frequent with such changes and is restricted to the face, neck and trunk. With the more malignant tumors it is replaced by emaciation. Edema of the face, feet and hands seems also to be associated with the more rapidly growing tumors. Not infrequently shortness of breath, weakness and cardiac palpitation accompany the edema. Symptoms referable to hypertension are frequent, and hypertension of a moderate type, varying from 138 to 195 systolic, has developed in tumor cases. It was uniformly lower in the cases with marked sex changes, and higher in those with obesity and plasma changes.

The mental alterations in these patients are at times pronounced. They are emotional, and some are very depressed. All our patients were somewhat difficult to handle while in the hospital. In 1 case the emotional change was more pronounced than the physical. After the cessation of her menses the patient developed a marked inversion-depression psychosis in which she did not speak voluntarily for almost two years. She showed obesity of Cushing's type, duskiness of the hands and face, polycythemia, and slight hirsutism and amenorrhea, but there was little change in the clitoris. No male sex hormone could be demonstrated in her urine. A tumor of the left adrenal was shown by air injection and x-ray. Immediately following its removal she spoke rationally, acted in a normal manner and chatted with her husband and family, and apparently resumed her normal interest in her surroundings. Such a change upon the removal of a hormonal tumor is of extraordinary interest from the point of view of its possible mechanics. The emotional changes in other cases were just as evident but much less marked.

The basal metabolic rates showed such a variation that they could only be interpreted in relation to the general state and not in specific relation to the adrenal situation. Chemical analyses of the blood showed no particular change, except that in some cases the cholesterol content was high. There was no demonstrable change in the blood chloride, sodium or potassium. Two tumor cases showed a low sugar tolerance, and in addition metabolic and plasma changes, obesity and edema. An autopsy in 1 of these cases showed a normal pituitary gland and pancreas.

The 20 cases of women without demonstrable tumor presented a varying number of the symptoms of the adrenogenital syndrome (Broster and Vines¹⁹): hypertrichosis of the male type, menstrual dysfunction, changes in the body contour, changes in the genitalia, changes in the larynx, and changes in the psychologic outlook. Since these symptoms are also those produced by cortical tumors, a differential diagnosis in some cases is difficult without visualization of the adrenal. All in all, the changes in the cases without tumor were less pronounced and more varied than those in the tumor cases.

The changes in menstruation varied. In several the amenorrhea was primary, menstruation never having taken place. More frequently menstruation was scanty, infrequent or irregular, in contrast to the tumor cases, where complete cessation was the rule. On the other hand, some of the non-tumor cases had little change from normal. These patients did not complain of headache or

nervous, suppressed catamenial periods as did those with tumor. Not infrequently in some of the older cases there was a long history of symptoms—ten or twenty years—with little acceleration, a duration most unusual in tumor.

The hypertrichosis in the non-tumor cases was varied. In some it was of a moderate growth, but in a few it was extraordinarily profuse. The head hair, however, more uniformly kept its normal color. No tendency to baldness was seen. The hair of the body and face was coarse, but not so uniformly coarse and dark as in the tumor cases.

Changes occurred in the sex organs in 12 cases. These were an enlargement of the clitoris and an increase in the size of the labia. The breasts were undeveloped in 11 cases, in the remaining 9 they were apparently normal. At operation these cases did not show the uniformly small, contracted ovaries seen with tumors. Two had cystic ovaries, neither of which showed any masculinizing cells on section.

Obesity was present in 8 of the non-tumor cases. The most pronounced was that of a girl of 20 who weighed 365 lb. She looked at least thirty-five years old. The obesity was of a generalized type. The body contour apparently varied with the age and onset of virilism. The younger female patients resembled boys, but the older ones were feminine in appearance. Seven had male figures, there were 3 long, bony individuals who had both male and female characteristics. The voices were deeper than normal females only in those cases in which hirsutism had begun in early youth. Of the skin changes, dryness and acne were infrequent, and duskiness of the hands and face did not appear.

Emotional instability as a whole was less marked among the non-tumor cases. A few were difficult to control, because of a predominating fear of harm. Normal sex attraction with a feminine psychology was present in most. A frequent complaint was depression because of apparent lack of sex appeal.

A definite loss or lack of fecundity seems to be associated with the adrenogenital syndrome, children being unusual among those who marry. In addition, a certain hereditary or familial influence is present in some non-tumor hirsutisms. This syndrome occurred three times in sisters, and 1 of these had a cousin and two paternal aunts with the same changes. Although the comparison is only suggested, these patients often seem to resemble the animals, produced experimentally, which have been described as intersexuals or freemartins. There were no twins in any case, but there is experimental evidence showing that some hormonal influence besides that of a male twin may produce such conditions.

DIAGNOSIS

In cases of adrenal tumor without endocrine syndrome, the most frequent symptom has been pain in the side involved. The tumors as a rule have been large and often palpable in the region of the kidney, which they displace downward. This can be shown by x-ray photographs and pyelograms. As has often been stressed, the upper pole of the kidney is moved so that the hilum faces downward, a position that does not occur in ptosis or in renal ectopia. In some cases actual invasion of the kidney has given irregular compression shadows of the pyelographic media similar to those produced by renal tumors.

When the adrenogenital syndrome is present the diagnosis lies first between a possible tumor of the pineal gland, pituitary, thymus, ovary or adrenal gland. When the presence of a tumor cannot be established, increased activity of certain glands has been suggested as a cause. This activity is frequently assigned to the adrenal cortex. When a glandular tumor is present there appears to be some variation of symptoms in accordance with the gland involved. The hirsutism of pituitary dysfunction has been described as the silky, lanugo type, and the facial growth predominates on the cheeks. Hirsutism due to ovarian growth is more universal, somewhat masculine but often scanty. When the growth is due to involvement of the adrenal it is characterized by coarseness, darkness and wide distribution, being present on the lips and chin. The types of obesity in these glandular disturbances are somewhat variable. Pituitary obesity has been characterized as of the girdle type, ovarian obesity as generalized, and adrenal obesity as involving the face, neck and body, but less marked in the extremities.

To diagnose the condition of the adrenals, air injection of the perirenal fascial spaces, followed by its visualization by x-ray, has been used by us in all the established cases, and also in others where an adrenal lesion was suspected. This method,²⁰ more than any other except exploration and direct vision, has at least given us some intimation as to whether gross anatomic changes are present. A tumor was diagnosed in 9 of our cases by the use of air injection and x-ray. Bilateral adrenal hypertrophy was diagnosed in 2 others. Gross changes which could be considered as tumors were not seen in any of the other cases. In a number of cases reinjection and x-ray photography were carried out and the shadows were compared with the earlier ones, in order to see whether any change had taken place. In 6 cases the adrenal could be visualized only on one side. When the proper fascial plane was not injected in such a way as to visualize the adrenal, this side was usually reinjected with

larger amounts of air. This usually resulted in the visualization of the correct fascial planes.

The early studies on excretion of sex hormones gave a rather puzzling picture.²¹ In tumor cases, women with amenorrhea and a masculinizing syndrome showed what was considered to be normal amounts of urinary female sex hormone. Why such patients, with apparently normal amounts of hormonal excretion, did not menstruate was not clear until Gallagher²² showed that they excreted large quantities of male sex hormone, in fact larger amounts than were found in the urine of normal adult males. A reduction of the excretion after removal of the tumor was also shown. Encouraged by the possibility that such a hormonal test might be an important factor in the diagnosis, Kurczok²³ made further studies on tumor and non-tumor cases which showed that excess amounts of male sex hormone were excreted in cases of adrenogenital syndrome without tumors, being discovered either by air injection and x-ray or by operation and section. One of the largest amounts was found in a non-tumor case with hirsutism, dysmenorrhea and obesity.

It seems, so far, that excessive amounts of male sex hormone in the urine are associated with androgenic tumors. It is reduced on their removal, but the hormone may be present when no tumor can be shown, and in amounts that vary with the masculinization of the patient. With the removal of half of an adrenal in some non-tumor cases, the adrenal that was sectioned had some association with the hormonal excretion because of clinical improvement, as first shown by Broster and Vines.¹⁹ We were able to confirm this. Diminution of the amount of adrenal cortex appears to be followed by a concomitant decrease in hormone excretion.

Recent investigations by Reichstein,²⁴ by Wintersteiner and Pfiffner²⁵ and by Kendall et al.²⁶ have shown the presence of a number of sterol-like substances (steroids) in the adrenal cortex. Some of these are easily converted into substances with male hormone activity (androgenic), one androgenic steroid occurring naturally in the adrenal. From the urines of cases of adrenal tumor and of adrenogenital syndrome, a number of steroids were isolated by Callow,²⁷ by Burrows, Cook, Roe and Warren,²⁸ by Broster and Vines²⁹ and by Butler and Marrian.³⁰ Some have been identified chemically and have revealed androgenic properties, others have not yet been identified chemically nor tested physiologically. Of particular importance, however, is the compound pregnane-3, 17, 20-triol, recently isolated by Butler and Marrian³⁰ from the urine of women with adrenogenital syndromes. The excretion of this steroid seems to be associated with the syndrome, since it does not take place in

men or in normal pregnant or nonpregnant women, and since the steroid was not found in the urine of a case of adrenal tumor after removal of the enlarged gland. Report upon its physiological properties will be awaited with interest, as will comparison of such findings with those in other adrenocortical tumors.

PATHOLOGY

Most of the tumors are reddish-yellow and globular or ovoid, and have a thin, fibrous capsule. There may be invasion of the neighboring organs, the kidney being involved most frequently. The histology varies, although certain types often show a constant symptomatology.

In the male without endocrine symptoms, it was not possible even to guess from which cell structure of the adrenal cortex the tumor was derived. Section showed many large irregular cells with very large and bizarre-shaped hyperchromatic nuclei, often with mitotic figures and a pale, granular cytoplasm. These tumor cells showed a deep fuchsinophilic reaction in the cytoplasm with the trichrome stain, similar to the cytoplasm in the cells in adrenals from adrenogenital syndromes as described by Broster and Vines,¹⁰ which they suggested were characteristic of that syndrome. We have examined sections of an adrenocortical tumor sent to us by Dr. N. W. Roome of the Department of Surgery, University of Chicago. This tumor was removed from a man who had no endocrine symptoms. The sections resembled that of our male case, with perhaps fewer giant cells to the field. The main cellular structures of these two tumors resembled each other, however.

In the female without endocrine symptoms the tumor resembled more the zona fasciculata of the adrenal, although other sections in places resembled the other two layers. As a whole this tumor more closely approached those described as renal hypernephroma than did any of our adrenal tumors. Sections stained to determine fuchsinophilic granules showed that the cells contained them in only small amounts.

The tumors from cases with virilism varied from obvious carcinomas to what have best been described as adenomas. The cells of the malignant tumors were of relatively uniform appearance, although they varied in size. They were rather large and irregularly rounded or cylindroid, with well-defined cell membranes and a voluminous, faintly acidophilic cytoplasm. In some areas the cytoplasm was vacuolated, as if containing lipid. One of the carcinomas—from a case with marked sex changes—had a considerable proportion of cells that stained with fuchsin and showed a bright-red cytoplasm. In the others the propor-

tion was less marked. As a whole it appeared from careful study of these sections that the tumor cells resembled more the inner or reticulate layer of the adrenal than they did either of the other layers. Grollman³¹ suggests that such a layer may be concerned with certain phases of reproductive symptomatology, and may contain cell inclusions from the gonad which assume gonadal function in tumor growth. We have seen no evidence in our microscopic studies to support this suggestion. Broster and Vines¹⁰ described specific staining reactions of the cells of the adrenal cortex in cases of masculinizing syndromes and tumors. These we also encountered, but we have been unable to show the uniform predominate amount of such cellular staining as described by them. Further studies will be of interest.

The adenomas showed a large proportion of cells to have a cytoplasm filled with vacuoles, presumably lipoids, and clusters here and there of cells from the three layers of the cortex. It was impossible to derive from most of the vacuolated cells any suggestion as to their origin. The cells contained more or less the same amount of fuchsinophilic granules as was seen in controls.

Portions of the adrenals removed in cases of adrenogenital syndromes without tumors showed in most a cellular structure little changed from normal. Special staining in some cases showed an increase in cells with fuchsinophilic granules, but not to a predominant extent. It is possible that the portions of the adrenals removed by us may not have contained such areas, as described by Broster and Vines. We endeavored to remove a half or a third of a gland—first from what was demonstrated by air injection and x-ray to be the larger adrenal, and next from the thicker portion of that adrenal.

In one tumor sufficiently large for assay, Pfiffner³² reported that life maintaining hormone was not present in sufficient quantities for demonstration. Nor could Kurzrok²³ demonstrate any female sex hormone in this tumor. Although a steroid with androgenic activity has been isolated from the normal adrenal cortex, none has as yet been demonstrated in an adrenal tumor.

TREATMENT

Surgical exploration is indicated in tumor cases. Transperitoneal incision permits exploration of the entire abdomen, together with examination of the ovaries and the spermatic fascial planes where adrenal rests may occur. It also allows ligation of the vascular supply of the tumor before its manipulation, and theoretically lessens dissemination.

In the cases of tumors without endocrine symptoms the growths were so silent that they had

reached a large size before discovery. In the cases showing no demonstrable metastases the tumors were removed with only such technical difficulty as was caused by their size. Two of these patients made uneventful postoperative recoveries.

In the tumors with endocrine changes the operative risk appears to be better in cases with well-marked androtropic symptoms and with little metabolic change. This is especially true if a normal adrenal shadow is visualized on the opposite side and the presence of the second gland is confirmed at exploration. One such patient made an uneventful recovery. The patients with marked changes in metabolism are poorer risks. Three of our tumor patients went into acute adrenal collapse shortly after removal of the tumors. Two had well-marked metabolic changes with apparently normal-sized adrenal glands on the opposite side, while the third showed only a tiny shadow. One patient recovered with the help of multiple blood transfusions and saline infusions. Since she died later of metastases, there were evidently secreting tumor cells in these which may have influenced her recovery from the adrenal collapse. In the remaining 2 cases one patient died twenty-seven and the other thirty-two hours after removal of the tumor. Administration of a commercial preparation of life-maintaining hormone did not change the rapid fatal collapse in either case. Only slight and fleeting improvement followed blood transfusions and saline infusions. These cases showed a marked elevation of temperature, a very rapid pulse and a fall of the systolic blood-pressure readings to 50 or thereabouts. The patients were rational, observant and apparently comfortable up to a terminal convulsion. In both cases the tumors were small, one being a carcinoma and the other an adenoma. In the carcinoma the opposite adrenal was tiny. In the adenoma a normal-sized opposite adrenal was visualized but on autopsy it was shown to be thin and with atrophic cells. It has been suggested that in tumors of this kind, which are secreting large amounts of hormone necessary for plasma tone and function, the flooding of the organism by the tumor cells with such hormone or hormones causes functional and actual atrophy of the opposite adrenal. Support for this explanation has been advanced experimentally, especially by Ingle and Kendall,²² who showed that the administration of large amounts of cortin to a normal rat over a sufficient period of time produced atrophy of the adrenal cortex. In addition, they have demonstrated that such an atrophy can be prevented by the administration of a fraction of anterior pituitary extract which has high adrenotropic activity. Such experimental evidence explains why collapse is less frequent in patients with changes of the sex type,

and suggests in cases with metabolic changes a preliminary course of injections of fractions of such a pituitary extract, before operative removal of the tumor. Whether such injections will produce reactivity of functionless adrenal cells awaits demonstration.

Parts of the adrenals were removed in selected cases of adrenogenital syndrome without demonstrable tumors. In 2 of these cases, on account of obesity, operation was effected through the flank, the others were all explored by an anterior transperitoneal exposure, which allowed a thorough examination of all possible areas of adrenal rests as well as examination of the ovaries. The incision was made on the side of the largest adrenal and a section was removed through its densest portion. The deep location of the adrenal and its blood-vessel attachments makes such a procedure somewhat difficult in the obese, despite all types of mechanical aids. There was no postoperative mortality or complications in these cases.

RESULTS

Adrenal tumors without hormonal symptoms showed large, silent carcinomas that had been growing for a considerable period. Such tumors do not offer a high percentage of cures. Of our 3 cases of this type, 1 died without operative interference, 1 died of pulmonary and liver metastases one year after removal of the tumor, and 1 is alive, apparently without metastases, more than a year after operation.

Adrenal tumors with androtropic changes, if operated upon early enough, have a fair prognosis. They are usually of slow growth and remain encapsulated for some time. It has been our hope that air injections of the adrenals will demonstrate these tumors earlier than they are usually diagnosed. A number of operated cases have been reported as having had several years of follow-up without a recurrence. One we have followed for over three years without demonstrable metastases. Where metastases have occurred they have shown themselves by a recurrence of the syndrome. They have appeared most frequently in the lungs. There is usually a quick symptomatic recovery in these cases, especially in the menses and in the secondary sex organs—breast, clitoris, and so forth. The younger the subject, the more rapid is the recovery. That in the hirsutes varies, it is usually satisfactory except on the face, especially in those that have shaved. No improvement occurs in such fixed changes as dentition and closure of the epiphyses.

In the cases of adrenogenital syndrome without tumor, the administration of female sex hormone over varying times has in most cases given no lasting results. Following the bilateral injec-

tion of air around the adrenals in several cases of amenorrhea, we have, strangely, seen the return of menstruation but have found no explanation of the phenomenon. In cases submitted to exploration there has been some improvement in the symptoms after the exposure and removal of portions of the adrenal cortex, mostly in the menstrual sphere. Changes varied from a return of the menses to an increased regularity or an increased flow. In several cases there has been improvement of the body contour with a change in breasts and hips. There have been disappointingly few and slight changes in the hirsutism, with usually no change on the face. This has been one of the factors that has kept these women psychologically upset. We have seen no changes in the genitalia or in the voice.

One of the cases of tumor showed upon later air injection and x-ray an increase in the size of the remaining adrenal. A somewhat similar increase of the untouched adrenal apparently occurred following operative removal of a portion of the other adrenal in cases of the syndrome without tumor. A continuation of the study of these cases will show whether such a change will be accompanied by a recurrent increase in the symptoms of the syndrome.

SUMMARY

Adrenocortical tumors may occur without evident endocrine changes, but they are usually accompanied by characteristic hormonal changes. These are of three types: (1) changes in the secondary sexual characteristics toward masculinity in the female (androtropic) and rarely in the male toward the female (gynecotropic), (2) maturity in the young and more advanced age in the mature, (3) changes in the metabolism of plasma, fat and skin. In some cases one or the other type may predominate.

Similar endocrine changes called the adrenogenital syndrome, occur without any demonstrable tumor, but the symptoms are usually longer in duration, less pronounced and more variable, and not infrequently have a familial tendency and resemble the experimental intersexual animal or freemartin.

The adrenals may be visualized by x-ray after perirenal air injections.

The urinary sex hormones are usually excreted in amounts varying with the sexual changes, and seem to occur in both tumor and non-tumor cases. The excretion of male sex hormone is reduced following removal of a tumor, and apparently is also reduced following diminution of the adrenal cortex by operation when no tumor can be discovered.

A specific hormone may be excreted with some tumors.

The cellular structure of the tumors varies. The androtropic tumors most nearly resemble the reticulate layer. Fuchsin granules in the cytoplasm of cells have been demonstrated in both hormonal and non-hormonal tumors, but appear to be more predominant in the former.

The removal risk in cases of androtropic tumor is less than in those in which marked changes in metabolism occur, because in the latter, atrophy of the opposite adrenal is frequent. This atrophy has a suggested preoperative therapy.

Removal of the tumor produces a symptomatic cure but does not correct the fixed anatomic changes. The facial hirsutism often persists. When removal of a tumor is followed by metastases, the same endocrine changes recur that were present with the original tumor.

With operative decrease in the amount of adrenal cortex in non-tumor cases, there are some symptomatic changes. These are most marked in the menstrual sphere, with some changes in the body contour and psychologic state, and with little or no changes in the hirsutism, and in the genitalia or voice.

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DISCUSSION

DR. CHARLES H. LAWRENCE. I agree that these tumor cases show several different types, and that we do not know as yet what kind of tumor goes with each type of symptomatology. I thought perhaps it would be interesting to report 3 cases in which the results are fairly well established, and tend perhaps to emphasize several of the things that Dr. Cahill mentioned.

Case 1 A girl of 13 years and 10 months was first seen in 1928. There was nothing of significance in the family history, except that the mother and one sister had had irregular and profuse periods. The patient had had an operation for acute appendicitis. She began to menstruate at 10 years and 8 months, which suggests that possibly some endocrine disturbance was already producing early maturity. During the next 9 months her periods occurred every 28 days, without pain. In June 1928 she menstruated normally, but had not done so since that time. During the first 6 months that we followed her she had anemia, but there was no change in her general condition.

One of the striking things is the relation between the development of symptoms and the time when it becomes possible to make an accurate diagnosis of adrenocortical tumor. Little attention was paid to her lack of menstruation until June, 1927, when masculine tendencies were first noticed—there was hair on the face and chest, and the voice became deeper. Her general health was excellent.

Physical examination showed a normal, well-developed female. There was acne on her face and back, which is a common symptom of adrenocortical tumor. There was dark, coarse hair on her arms, legs and back and her pubic hair extended up to her navel. Her clitoris was larger than normal. Rectal examination revealed a rather small uterus. There was no other pelvic abnormality. Nothing was shown by abdominal examination. The physical findings were otherwise normal. The laboratory examinations were all negative. The basal metabolic rate was normal. A kidney function test was normal. X rays of the skull, kidney and urinary tract showed no lesions. The eye grounds and visual fields were normal. Pelvic examination under an anesthetic showed no abnormality except a small, hypoplastic uterus.

We thought of a tumor of the adrenal cortex, a tumor of the ovary and possibly a tumor (basophilic) of the pituitary gland or one of the pineal gland, but there was nothing upon which we could establish a diagnosis. The patient was kept under observation for a year, and her condition remained essentially the same. At the end of that time she was seen by the late Dr. D. L. Jackson, who thought there was sclerosis of the ovarian cortices. Exploration revealed a small uterus with no endometrium. The ovaries were also small. There was retroversion of the uterus, the tubes were normal, the ovaries were smooth, with thickened cortices, and were packed with small cysts which were evacuated. The left kidney was normal on palpation, no abnormality of the right kidney was found, although the operator was not sure he had felt the adrenal. There was an uneventful recovery and no change in the symptoms. The patient was seen at 6-month intervals for the next 6 years, with no significant development until September, 1934, 5 years after operation. At that time she had developed moderate dyspnea and palpitation on vigorous exertion. This was the first new sign after the original development of masculinization. The systolic blood pressure, which had been normal, rose to 180. The renal arteries were not found to be narrowed. Hair appeared around the areolae.

An abdominal examination was negative. Pyelograms showed the right kidney to be larger than the left. The infundibuli and calices filled well. Neither Dr. G. C. Prather, who saw the x rays, nor Dr. L. R. Morrison felt that there was enough evidence of tumor to justify an operation. In April, 1935, x rays were again taken. The slight hypertension persisted. On palpation a definite mass was felt in the left flank. Pyelograms showed numerous areas of calcification in the region of the tenth lumbar vertebra and the tenth rib. There was a suggestive mass overlying the left kidney. The patient was operated on, and a tumor of the left adrenal was removed. It was completely encapsulated, and scattered throughout were small spicules of bone. Because of the size of the tumor it was necessary to remove both the adrenal gland and the kidney. Soon after the operation there was a fall in blood pressure. Many generous doses of Eschaun were given. The blood pressure stopped falling, and the level of the blood pressure readings seemed to depend upon the size of the doses of Eschaun. There is some difference of opinion as to the physiologic action of products of the adrenal gland now on the market, but Eschaun did seem in this case to have some effect in raising the blood pressure.

Before the patient left the hospital the umbre of her voice returned markedly to the feminine, and in 2 months it was back at normal. She began to menstruate in September. From that time she has continued to menstruate perfectly normally. This is interesting in the light of her ovarian lesion and the operative trauma to the ovary.

One year after operation examination showed some little gain in weight, which had been normal. Although there was a marked degree of hypertrichosis, this was not bothersome because the patient shaved daily. A year later it had practically disappeared. Only a little hair was left on the face.

It seems interesting that the tumor must have been there for at least 5 or 6 years before definite symptoms allowing diagnosis could be made, although clinically the diagnosis was determined before operation.

Case 2 A 24-year-old woman was first seen in March, 1934, in coma. The family history was negative and the past history not remarkable, except that she did not menstruate until she was nearly 16. Catamenia were regular

and normal for 2 years. She then developed menorrhagia with moderate secondary anemia, which persisted until the age of 21. At that time she had a flat sugar tolerance curve. Physical examination showed nothing remarkable except that the uterus, according to Dr F S Newell, was small. After 3 months of treatment with Antuitrin S the menorrhagia disappeared, it did not recur. From then until early in 1936 the patient appeared to be in perfectly normal health. Her current illness began while driving a car, when there was blurring of vision, and faintness. She was able to drive home, and after luncheon felt normal. The next night after retiring she went to her sister's room and returned to her own room. She was heard to fall, and when found, she articulated with difficulty and her speech was incoherent. After drinking a glass of orange juice she seemed as normal as ever, but did not remember going into her sister's room. For a week following the bout of fainting, she was well, and then fell into a coma, from which she could not be aroused.

Physical examination showed a normally developed individual. The blood pressure was normal. The pupils reacted to light. The reflexes and heart and lungs were normal. A mass was palpated which extended from the left caudal region to the left flank, and was resilient. The blood sugar was 40 mg per cent. The plasma carbon dioxide-combining power was 51 mg per cent, and the urine acetone 4+. The administration of 1000 cc. of 10 per cent glucose was started. The patient regained consciousness after 50 cc. had been given, and was able to answer questions before the dosage was completed. She had been aware of a prominence in the left upper quadrant for 2 or 3 months, but thought it was only a roll of fat. She was seen by Dr E L Young, who suspected a pancreatic cyst because of hypoglycemia and low blood pressure. Exploration revealed a large, bluish red mass, which was highly vascular. It extended backward into the posterior abdominal wall, and appeared to be fixed. A trocar was introduced, but no fluid was obtained. Removal was impossible and a small specimen was excised and the wound closed.

Examination showed the growth to be a cancer growing with moderate speed and originating in an endocrine gland. Whether it arose from the cells of Langerhans or the adrenal cortex was not known, but the latter was considered to be more probable. There was a slow and uneventful recovery from the operation.

The blood sugar varied from 41 mg per cent to lower levels. There was a later reading of 61 mg, and the last one taken was 60 mg. The low readings were not always accompanied by clinical symptoms of hypoglycemia. The blood picture was normal. Determinations for urinary prolactin and estrin were negative. Menstruation continued for 2 months and then ceased, and has not been re-established. X ray treatment was given, during it there were no major hypoglycemic attacks, although the patient occasionally felt dizzy.

On July 10, 1936, the x ray treatment was discontinued. In October coma frequently recurred, but it invariably responded to intravenous glucose, the blood sugar content at that time was 110 mg per cent. Acne, which was present at operation, grew steadily worse, it involved the entire face, chest and back, and there was also marked acanthosis of the axillae. The tongue became thick, and so did the subcutaneous tissues of the shoulder and neck. This condition did not resemble simple obesity. The blood chemistry was entirely normal. Hormone assays were again done, but no signs of prolactin or estrin were found. Other x rays were taken but no metastases were found. On October 13, 1936, a second attempt was made to remove the tumor, by Dr W E Ladd, who used a flank in-

cision, but this was found to be impossible. Diagnosis of a tumor of the suprarenal cortex was confirmed.

There then occurred a number of interesting developments. For 36 hours after the operation the temperature rose to 104.4°F, and the pulse from 120 to 180. The blood pressure fell to 120/50. The patient became unconscious but was revived after intravenous glucose. The blood picture and the physical examination were both normal. On the 3rd day after operation there was marked improvement, the temperature was 101°F and the blood pressure returned to normal. During the next 2 weeks there was marked general improvement. The subcutaneous thickening had almost disappeared. The acne and the acanthosis also practically disappeared. The patient left the hospital in good condition, and no more hypoglycemic attacks occurred.

A month later the patient's condition grew worse. Her systolic blood pressure rose to 190, and she developed edema of the lower legs. Dullness in the lower abdomen was occasionally demonstrable. Attacks of coma became more and more frequent. During one of them delay in preparing glucose forced us to give 1 cc. of adrenalin. The effect was surprising, and before the glucose could be brought into action the patient recovered. Since that time we have repeated the adrenalin, and find that as little as 0.3 cc. of a 1:1000 solution restores the patient to consciousness just as efficiently as does glucose.

This is an interesting endocrine situation, one which we can only explain by saying that the hypoglycemia is not due to exhaustion of sugar reserve, but to a break in the chain which renders it impossible for her to take glycogen from the liver when the blood sugar content gets too low. Adrenalin seems to fuse the chain again, and the blood sugar becomes normal.

The patient showed very little loss of strength. In January, 1936, she had another exacerbation. After consultation with Dr E D Barringer and Dr James Ewing she was sent to New York and given radium packs, since then she has had x ray treatment. On April 9, 1936, I examined her because of failing vision. At that time examination of the eye grounds showed only moderate sclerosis of the arteries but no exudate or hemorrhages. Since then, I have heard, her vision has improved. The lesion is probably circulatory. I have not seen reported in the literature any disturbance of carbohydrate metabolism like that which this patient shows.

Case 3. In this case the clinical picture was difficult to distinguish from that of pituitary basophilism. The patient, a 30-year-old white woman, entered the hospital in 1934 because of blurring of vision of 18 months duration. There was a history of polyuria and nocturia of 9 months duration, and of undue fatigue for several years. The patient had always bruised easily. There was an increased growth of hair the previous year, the new hair being red and fine (she was red headed). One of her brothers had died of diabetes. Otherwise the family history was normal, as was her past history. Her periods started at 11—a bit early. They were regular until 1931, when they were irregular for a month and then stopped, the patient's voice became harsh and her hair coarse, and she gained 25 lb in weight. At that time she was seen at the Lahey Clinic and was found to be overweight and nervous. Her heart was moderately enlarged and the aortic second sound was accentuated. The blood pressure was 240/130. The pelvis was negative. There was edema of the lower extremities. The eye grounds showed no abnormality. The nonprotein nitrogen was 32 mg per cent. The blood picture was essentially normal. The specific gravity of the urine varied from

1005 to 1014. A diagnosis of primary hypertension was made.

During the next few years there was increased fatigability, and for the last year before admission it was necessary for the patient to remain in bed a day or two at a time. Blurring of vision increased steadily, and there were fixed spots before the eyes for 2 weeks before admission. Reading was difficult. The eyelids became puffy and it required effort to hold the eyes open. On admission there was an increase of the hair on the face. The skin was black and blue over the lower legs and ankles and the feet were swollen. There was reddening of the facial skin. Obesity was localized in the abdomen and breasts. There was pitting edema of the legs. Reddish-blue striae occurred on the medial aspect of the thighs. There was an increase in hair. The fundi showed characteristic choking of the disks, with exudation in the right eye. The lips were cyanotic, and the skin was dry and scaly.

There was much discussion in the hospital as to whether there was a basophilic or an adrenocortical tumor. The neurological examination was negative. The patient showed a tendency to increased production of red blood cells, and had a hemoglobin of 103 with 5,500,000 red cells. The blood cholesterol was also high. The non-protein nitrogen was 52 mg per cent. The glucose following a tolerance test, showed a high curve regaining 246 mg in half an hour. The curve remained high (172 mg) at the end of the test. The urine showed normal dilution and concentration, with a phenol sulfonphthalein of 49 per cent. The albumin was constant, between 1.0 and 1.5 per cent on numerous examinations. The sediment showed many finely granular casts. A pyelogram was negative, and x-ray photographs of the skull showed no evidence of tumor. The electrocardiogram was normal. The blood pressure was 200/160. The basal metabolic rate was normal. The general consensus myself dissenting, favored a diagnosis of malignant nephrosclerosis with pituitary basophilism. I insisted on a diagnosis of adrenocortical tumor until Dr. F. H. Lahey operated and removed a left adrenal tumor. The blood pressure fell to 120 and continued to fall in spite of intravenous injections, including Eschschin, and the patient died. Postmortem examination showed absence of the left adrenal gland and extreme atrophy of the right one which weighed less than 0.5 gm. The capsule was thickened and the medulla almost absent. A few cortical cells remained. The right gland contained cysts as well. Microscopic examination revealed an adenocarcinoma. Serial sections were made of the pituitary, but careful search failed to show any signs of basophilism.

These three cases bring out some interesting considerations regarding the endocrine glands. In the first case masculinization was marked, in the second, there was little masculinization but an odd change in carbohydrate metabolism in the third, there was masculinization, but of a moderate type. All three patients had adrenocortical tumors. The very early onset of menstruation in the first case and the definitely late onset in the second suggest that the excess of hormone may have been due to a pituitary factor long before the clinical picture had developed.

A PHYSICIAN: What was the pathological report in the first case?

DR. GEORGE C. PRATHER: Carcinoma simplex.

DR. FULLER ALBRIGHT: I should like to ask one question. We are indebted to the Presbyterian Hospital in New York City not only for knowledge concerning increased and decreased function of the adrenal gland, but also for the

fact that Loeb first called attention to the fall in sodium in Addison's disease. Have you carried out studies in order to see whether any abnormality in sodium accompanies excess adrenal function?

GROLLMAN: I believe that the androgenetic hormone is produced by another cell in the adrenals is entirely theoretical, in that the hormone is assumed to come from some remnant which yields masculinizing hormone. If this were the case, we should not find atrophy of the other gland. To do so would be strong evidence against Grollman's theory.

I was very much interested in the mention of polycythemia and decreased blood volume. We have found these at the Massachusetts General Hospital; they may constitute a very important clinical point. Many patients die in a state of shock after an operation on the adrenals. This has been explained by the fact that the other gland has atrophied. It is probable however, that some of these patients succumb to shock due to the decreased blood volume.

I was hoping to hear something about bones, for we are very much interested in this subject. The osteoporosis which occurs in some of these cases is significant. In 1 case the presenting symptom was a decrease in height. The patient eventually died from an adenocarcinoma and stones in the kidneys. There is an increased excretion of calcium in the urine in spite of the normal blood calcium and phosphorus. This patient showed a perfectly normal parathyroid post mortem so that the increase in decalcification cannot have come from that. We think that bone disease is due to senile osteoporosis, after all, it consists very largely of increased precocity. There is heightened sex development, and also mental and physical development. The same thing happens if there is an increase in secretion by the adrenals, thus, precocity in the adult results in senility, which, in turn, causes changes in the bones.

DR. JOE V. MEIGS: I should like to ask about the second slide in the case of adrenocortical tumor, may this not have been a chorioepithelioma, and was not the man demasculinized? It looked to me like a chorioepithelioma, and if it were, such a diagnosis would be very interesting. Secondly, in masculinizing tumors in the female the hormone is produced separately by the lining cells, which are present and can be seen in the arrhenoblastoma. They stain with Sudan III. It may be that the clear cells were the cells of this tumor and that the masculinizing hormone recovered in the urine was produced by them.

DR. GEORGE W. HOLMES: The roentgenological problem is to establish the presence or absence of these tumors. In order to do that one must have the best quality of films. Whether we can improve the technique by newer methods is somewhat problematic, but it is expected that we may do so with fast machines and better focus points. It may be possible for us to help more than we do at present. We depend upon the air injection, which must be properly done otherwise the x-ray is of no value.

The next problem is the interpretation of the film after we have developed it. The adrenal gland is of many shapes and sizes and when we look at x-ray pictures of it we see only the projection of the shadow in one of many planes. It is very difficult for us to describe the gland. Dr. Cahill has been able to diagnose accurately some of the larger and more characteristic tumors. I fear we shall always have trouble with the smaller and less characteristic ones. I have not had an opportunity myself to carry on this work, but I have seen others do so. Dr. Richard

Schatzki is here and can probably give a better interpretation than I can.

DR. RICHARD SCHATZKI I should like to ask two questions. Has Dr. Cahill any standards as regards the size of a normal adrenal x ray picture? We have had decided difficulty with borderline cases, and described one medullary tumor as an upper limit of normal, whereas it was abnormal. Has he used lateral films in order to demonstrate the thickness of adrenal tumors? We have tried them unsuccessfully.

DR. WILLIAM C. QUINBY I want first to compliment Dr. Cahill on his adept handling of a very abstruse subject. He has not described a single type of case tonight. He has described cases of the adrenogenital complex in which there apparently was no lesion in the pituitary, and in some cases I do not feel that he has succeeded in demonstrating adrenal lesions either. This is a very complicated subject, and one on which we have been privileged, tonight, to hear the most advanced opinion.

To take up the subject serially, the injection of air around the kidney in order to demonstrate either renal or adrenal tumor I tried out a number of years ago. It is not an accurate method of examining either type of tumor, especially the adrenal. Everything depends upon the situation in the given case. In the first place, the injection must be made into the renal fossa. There are no results if it is made in the substance of the psoas muscle. The amount of air injected must be in excess of that which one would ordinarily inject for the demonstration of renal tumors. Furthermore, air is much better than oxygen, and nitrogen is better than air, the point being that one should inject a gas which is slowly absorbed, and make x ray observations at stated intervals afterward. One usually gets a very confusing picture of either renal or adrenal tumor within five or six hours after injection of atmospheric air around the kidney or into the renal fossa. The injection in every case, so far as the procedure goes, is similar. It makes no difference whether you are trying to outline the adrenal or the kidney.

The interpretation of x ray films is still somewhat questionable. The roentgenologist is doing his best to help us, but we must make many more injections before standardization becomes possible. The opinion in any one case may be either for or against the possibility of a tumor. A good many cases in which the adrenal is definitely at fault, as has been shown by Dr. Cahill, do not show a definite enlargement of the adrenal in the x ray films. Similarly, conditions in the pancreas or the parathyroids can well cause overfunction, which produces the symptoms of disease, without very much in the way of a demonstrable tumor. It is absolutely impossible in cases of hypoglycemia that have been successfully operated on, and that have been demonstrated by surgeons. An analogous situation probably exists in regard to the cortex of the adrenal gland. I am in doubt as regards tumors of the medulla, which are quite different in their clinical manifestations. What we are discussing, as I understand it, is tumors of the cortex of the adrenal. Undoubtedly a good many start or remain as adenomas, and only later do they become definitely invasive neoplasms. To be able to demonstrate such a condition in the adrenal in the early stage is beyond the reach of any roentgenological procedure that I know about. We must therefore depend largely on clinical manifestations. The reports of increasing numbers of patients—and, as Dr. Cahill tells me, they are large—will eventually bring a certain amount of clarity to a state of mind which in my opinion is still chaotic.

In the first place, we must eliminate tumors of the pituitary, because we know that this gland is probably primarily at fault in a good many variegated conditions affecting the secondary sex sphere. These have largely been excluded by x ray of the sella turcica. We next come to the question of what sort of adrenal the patient has. Within our present limitations we must be willing to investigate the adrenal by open operation. There are definite instances in which the clinical picture is characteristic, in spite of the fact that we may not be able to demonstrate any very striking differences from the normal through such procedures as the injection of air.

I call to your attention also the fact that, speaking clinically, most tumors of the adrenal cortex, so far as we know them today, have as their clinical effect an increase in masculinization. In women the changes lie in the direction of virilism. In men they lie in the direction of precocious puberty or hypervirilism. In many such cases the condition can be made clear by the pediatrician. My experience has been with individuals in whom the diagnosis should have been made while they were under the care of the pediatrician, not that of the urologist.

Two or three years ago I reported a case in which a child had been born and bred under the best possible circumstances and had been known to be precocious from his second year of life. He had gone through school at an early age, and was prematurely developed in body as well as in mind. He received no medical attention until, at the age of ten, while running a race, he had an acute abdominal crisis. Investigation revealed an abdomen full of blood, and it was later found that the free hemorrhage had been caused by rupture of an adrenal tumor as large as the patient's head. There were present hypertrichosis, acne, a decreased amount of sugar in the blood, hypertension, and every other condition needed for a diagnosis of adrenal tumor, but in that day it was not appreciated that the child probably had an adrenal tumor which eventually became malignant, and which might have been removed before it had become invasive, his life thus being saved. There was a perfectly normal adrenal on the other side. In many other instances, of course, the other adrenal is atrophied.

DR. CAHILL (closing) I am in accord with Dr. Quinby's statements in their entirety. I have taken special care to limit my statements to known facts. I gave no hypotheses and no theories, and I said that we used only the tools available at present in trying to arrive at a diagnosis. In 27 of the cases we diagnosed tumors in only 6, although the others had symptoms. I operated on many of them, following Dr. Quinby's idea exactly.

In making x ray pictures we take them serially, injecting air one day and taking them the next, we then repeat the procedure, looking for a lead, and that is all we do. The technic is imperfect, but at present it is the only means we have of detecting adrenal tumors.

In answer to one question, collapse occurs in some cases from hemorrhage into the abdominal cavity, in other cases I believe that collapse and death are the results of handling of the adrenal gland. In about 15 per cent of the entire population only one adrenal gland is functioning normally.

There are many functions of the adrenal gland, and many hormones. As shown by some of the reported cases, there are hormones producing masculinization and maturity, the latter is a tremendous force in the body, closing off the epiphyses and producing old age rapidly. There is the famous case in France of a patient who advanced from childhood to adulthood, became a father, and died of old age within ten years.

Dr Loeb studied all our cases with us. We could not demonstrate any abnormality in the sodium balance, and apparently there was none. In the adrenal cortex there must be cells with many different functions, and the final result depends upon the interrelation of the whole. We are just trying to make hypotheses in the direction in which it goes. We have tried to determine the particular change in salts which produces collapse. This factor is apparently known in animals, but whether it exists in human beings we are not aware. A woodchuck whose kidneys and adrenals are removed can live for four to six weeks in the winter, but only two days in the summer. What has hibernation to do with such things? The question is a fascinating one. I did not indulge in those phenomena but only

tried to call attention to the observations which seemed unassailable to ourselves.

In the second slide, it is true, the cells resemble those of a chorioepithelioma. In our experience these produce gynecomastia and large amounts of prolactin A. In fact, one can make the diagnosis of testicular tumors according to the amounts of prolactin.

What constitutes a normal x-ray picture I do not know as yet. I have made over one hundred so as to see what improvement can be made in present methods, and to gather experience and determine whether the glands are normal or abnormal. I admit that we may never get anywhere, but we are only using these tools to see how far we can go. We have not had very much success with lateral films.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24191

PRESENTATION OF CASE

First admission A sixty-two-year-old Russian Jewish woman entered the hospital with the complaint of fluid in the right chest of three years' duration.

Seventeen years before entry the patient began to have a persistent nonproductive, brassy cough and felt that there was "something in her chest that should be coughed up." She had no hematemesis, hemoptysis, dyspnea, orthopnea or peripheral edema. She was treated by her physician for six months without appreciable benefit and at the end of that time entered an outside hospital where by x-ray a large substernal mass was found. Bronchoscopy showed evidence of marked pressure on the trachea at its bifurcation. A biopsy of an axillary gland showed no evidence of metastasis. She refused operation and went to another hospital where she was given a course of radiation lasting over a period of many months. This gave her prompt relief, and she had no symptoms until three years before entry, when she had pneumonia which lasted about a month. She lost about 25 or 30 lb. in weight and did not seem to recover completely from the illness. She had difficulty in breathing and orthopnea, and her physician found a right-sided pleural effusion, which he tapped. From that time until the time of entry she had repeated reaccumulations of fluid, which were tapped on nineteen occasions. As the fluid accumulated she had dyspnea, orthopnea, some distention and tenderness in the region of the liver and spleen, but no peripheral edema. Her appetite was rather poor, but her stools were normal, and there was no tendency to constipation. She had no other significant symptoms except weakness and a total weight loss of 40 lb. during her entire illness. One year before entry she was given another course of radiation by deep x-ray, which was carried out over a period of nine months. The treatment had no apparent effect and did not decrease the size of the mass. The fluid withdrawn at the various taps was yellowish in color and on one occasion bloody, search for tumor cells in it was negative. Guinea-pig tests were negative. Her past and family histories were entirely negative.

Physical examination revealed a fairly well-

developed but poorly nourished woman in no great discomfort. There was marked dilatation of the superficial veins on the upper arms and anterior aspect of the chest. In the lower anterior part of the neck a smooth, symmetrical, moderately firm mass was palpable extending down into the neck. There was dullness over the lower two thirds of the right chest, with practically absent breath sounds at the right base. A few moist rales could be heard at the left base. The heart was slightly displaced to the left, and there was a harsh apical systolic murmur. The blood pressure in the right arm was 195 systolic, 80 diastolic, in the left arm 190 systolic, 80 diastolic. The liver edge was palpable two fingerbreadths below the costal margin. There was no edema of the extremities.

The temperature was 98°F, the pulse 80. The respirations were 22.

The urine examination was negative. The blood showed a red-cell count of 5,090,000 with 80 per cent hemoglobin, and a white-cell count of 7700 with 75 per cent polymorphonuclears. The Hinton test was negative. An attempt to determine the basal metabolic rate was unsuccessful because of lack of co-operation by the patient. An electrocardiogram showed slight tendency to left axis deviation and T waves which indicated a possible digitalis effect.

X-rays of the chest showed a large fairly symmetrical mass occupying the upper mediastinum and displacing the esophagus to the left and the trachea to the right. The trachea was considerably narrowed in the region of the thyroid, but neither it nor the esophagus showed any evidence of intrinsic disease. The mass lay chiefly in front of the trachea but extended posteriorly to press on each lateral wall. The margins of the mass were smooth, except for a slight nodular projection opposite the arch of the aorta. The lower two thirds of the right lung were obliterated by homogeneous dullness. The upper margin of this shadow was convex upward suggesting a mass surrounded by fluid. The heart and mediastinum were markedly displaced to the left, the displacement being out of proportion to the amount of fluid present. The left lung was clear, but there were fine linear areas of density extending outward from both lung roots. Films brought in by the patient taken over a period of two years showed very little change in the appearance of the mediastinal mass.

On the seventh day a right chest tap was done, and 750 cc. of amber blood-tinged fluid was removed. Its specific gravity was 1.010. No tumor cells could be identified in the fluid, and aerobic and anaerobic cultures and a smear were negative for bacteria. An x-ray of the chest taken after the tap showed no evidence of tumor in the right lung.

She was discharged unimproved on the eleventh day.

Last admission (four months later) During the interval her symptoms continued unchanged, and it was necessary for her to have repeated chest taps. She lost about 10 lb. more in weight.

Physical examination revealed a poorly nourished, orthopneic woman. The physical findings were essentially the same as on the previous entry. The blood pressure was 150 systolic, 90 diastolic, and pistol-shot sounds were heard over the brachial and femoral arteries. No enlarged lymph nodes were palpable. There was slight pitting edema of the legs, more marked on the right.

The temperature was 99°F., the pulse 104. The respirations were 25.

The urine examination was negative. The blood showed a red-cell count of 4,400,000 with 80 per cent hemoglobin, and a white-cell count of 3700 with 80 per cent polymorphonuclears.

She was found dead in bed on the evening of the second day. She had been seen two hours previously, and at that time her condition seemed to be as it had been on entry.

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES: These films cover a period of a little over six months and show what is described in the text. There is certainly a mass here, and the esophagus is obviously displaced to the left. One might question whether the trachea is actually displaced to the right, it may be, but there is quite a variation in the position of the normal trachea. A mass which displaces the trachea in one direction and the esophagus in the other would have to lie between the two, and one would have to think of an aneurysm. I do not see any indication of that here, however, we have a fairly good view of the aorta, and it does not seem to be dilated or deformed in any way. Aneurysm of a branch of the aorta is certainly rare without some change in the aorta itself. The lesion appears to be noninfiltrating.

DR. FREDERICK T. LORD: Where is the x-ray without the fluid?

DR. HOLMES: This shows the area of the tumor mass, and it is pretty free from fluid. There is a lot of fluid at the bases, however.

DR. LORD: It says in the record. The trachea was considerably narrowed in the region of the thyroid.

DR. HOLMES: This first film does not seem to show much narrowing of the trachea. The patient had a good deal of radiation and some of these changes may be due to fibrosis. In this second film, however, the trachea is narrowed in the upper portion. The mass lies more anterior than

posterior, although it occupies the whole upper part of the chest.

DR. AUBREY O. HAMPTON: One of the most interesting features in the case is that the size and shape of the mass have not changed appreciably in two years.

DIFFERENTIAL DIAGNOSIS

DR. LORD: The history suggests an origin in the mediastinum, later there was enlargement which resulted in the tumor that appeared in the neck. The mass did not respond to x-ray in the second instance, it may have in the first. It was probably not a lymphoblastoma. It was almost certainly not a malignant neoplasm originally but a benign tumor of some sort might have become malignant. Of course the difficulty which arises under such circumstances is to determine the nature of the process. There are many chances. It might be a fibroma, lipoma, chondroma, myoma, cyst adenoma, thymoma or, more plausibly, a substernal goiter. It might be an aneurysm, but the negative Hinton renders this unlikely.

Let us consider for a moment the pleural fluid. The specific gravity of such samples is often of considerable value. This one at 1010 was low. That is suggestive of a passive transudate rather than an inflammatory process but it might nevertheless be due to cancer. Some of the fluids secondary to cancer may be low in specific gravity.

This may be a substernal goiter. It is not an aneurysm, from what Dr. Holmes said about the x-ray and because of the negative Hinton test. Echinococcus cyst is a possibility, it cannot be dismissed. Then there is the dermoid, or the teratoma, and I feel confident that if I keep on making this diagnosis I shall eventually be right according to any system of chances. It is a little suggestive that she had a bronchostenosis because of the practically absent breath sounds at the right base, in spite of the fluid. Fluid does not give absent breath sounds. They may be very much diminished, but they are likely to be bronchial. We do not know whether these were bronchial. I cannot escape the thought that she might have bronchostenosis of the right lower-lobe bronchus.

It is of considerable interest to speculate as to the nature of the fluid. It might be tuberculous but she had no evidence in the lung of a tuberculous process, it is unlikely. It might be secondary to cancer, or to chronic passive congestion from pressure on the azygos vein. If this is a neoplasm which started as a benign growth and has now become malignant, the chances would seem to be that this fluid is of carcinomatous origin. Do intra-thoracic tumors, either benign or malignant, give

rise to pleural fluid by pressure and not always by extension of the growth or metastases? So far as my experience is concerned, pleural fluid in connection with tumors has invariably been due to the latter, so I am disposed to guess that the fluid is of such origin, but it would be of considerable interest to know whether it could follow passive congestion.

In addition to these matters she had hypertension, and a wide pulse pressure—195 systolic, 80 diastolic. Such a high pulse pressure with a pistol-shot sound over the brachial and femoral arteries is suggestive of aortic regurgitation. The harsh apical systolic murmur suggests mitral insufficiency. The immediate cause of death is hard to explain. She had hypertension. At sixty-two one should think of arteriosclerosis and cerebral hemorrhage or coronary disease. I submit as diagnostic possibilities a mediastinal dermoid or teratoma and carcinomatous pleural effusion.

DR TRACY B MALLORY: There is always a wide field for suggestions in these mediastinal tumors. Dr. Churchill, have you anything to add?

DR. EDWARD D. CHURCHILL: I saw this patient and know the results of the autopsy, so all I shall add is that I was brave enough to recommend operation at the time of the first admission and to recommend her second admission with a view toward reconsideration of operation which had been refused the first time.

DR. LORD: What did you think it was?

DR. CHURCHILL: Our reasoning was a good deal like yours in relation to the chest fluid. We thought that it was suggestive of cancer, but with the long duration of this illness and also that of the pleural effusion we decided that there was a possibility that it could be simply a substernal goiter and that her only chance was to treat it as such and operate through the neck to see if it could be removed. The whole thing might have been due to simple substernal goiter, the picture being confused by the radiation therapy which she had had before we saw her.

DR. BERNARD JACOBSON: I think the statement about the diastolic pressure being 80 does not do justice to the situation. We could hear the diastolic sounds going down to about zero, but never heard a diastolic murmur in the heart. At the time when we did not know anything about the diagnosis of the mass we were still puzzled about the accumulation of the fluid. I should like to ask Dr. Lord if he has any other suggestion for the extremely large pulse pressure.

DR. LORD: I do not know of any relation between pleural fluid and high pulse pressure.

CLINICAL DIAGNOSES

Mediastinal tumor
Pleural effusion, right
Hypertensive and arteriosclerotic heart disease

DR. LORD'S DIAGNOSES

Mediastinal tumor, dermoid or teratoma?
Pleural effusion, secondary to cancer?

ANATOMICAL DIAGNOSES

Substernal colloid goiter with compression of innominate veins
Hydrothorax, bilateral
Pulmonary atelectasis, left
Pleuritis, chronic fibrous, bilateral

PATHOLOGICAL DISCUSSION

DR. MALLORY: What we found at autopsy was an extremely large substernal goiter. The entire thyroid was enlarged and was made up of multilobular masses of which one in particular projected down through the suprasternal notch and appeared to press upon the innominate vein and the innominate artery. Histologically, it was a benign colloid goiter. There was virtually nothing else found at autopsy except an effusion. At the time of death there was nearly 3000 cc of fluid in the right pleural cavity, and about 800 cc in the left. The heart, in spite of the blood pressure, was practically normal. It weighed only 310 gm, certainly a minimal degree of hypertrophy, and the valves were entirely negative. How this woman's peculiar pulse pressure is to be explained, I have no idea. I was inclined to believe there was enough pressure upon the great veins in the mediastinum to account for the accumulation of fluid.

DR. WYMAN RICHARDSON: Why did she die?

DR. MALLORY: There was no explanation why death should have been so sudden. Her vital capacity must have been reduced. She had nearly 4000 cc. of fluid in the chest. It is only fair to point out that very large amounts of pleural fluid can accumulate within a very few hours, so that that does not necessarily mean negligence when the physician has found no evidence of it. We have seen cases which have been checked by x-ray examination where as much as 4000 cc of fluid has accumulated within twelve hours.

DR. HOLMES: Did the lungs show any evidence of fibrosis from radiation?

DR. MALLORY: We noticed some fibrosis of the pleural surfaces, but we did not examine them particularly with that in mind, so we may have missed diffuse intrapulmonary changes.

DR. GEORGE W. W. BREWSTER: Could the goiter

have been removed by operation at any time?

DR. MALLORY It certainly could have been removed during the first fifteen years, possibly on the first admission.

DR. HOLMES Do we know how much radiation she had?

DR. JACOBSON There is some statement about it in the record. She apparently had regression of the substernal goiter after the first x-ray treatment seventeen years previously.

DR. MALLORY You would not expect x-ray treatment to have much effect on a colloid goiter, I should imagine.

DR. HOLMES Not if it were colloid. I think it is justifiable to treat if you have a correct diagnosis. If you knew that the patient had intrathoracic goiter and operation were refused or not considered justifiable, the proper amount of radiation to the gland would be considered good treatment, but the trouble in all these cases is that you are never sure of the diagnosis. Radiation may be the wrong thing to do.

CASE 24192

PRESENTATION OF CASE

A seventy-year-old, white, Canadian foreman entered the hospital with the complaint of loss of function of his legs of three weeks' duration.

He was entirely well until three months before entry when he wrenched his back while lifting a crate of eggs. He had a sudden sharp pain localized in his left hip which lasted for a few minutes. He finished his work that day but had difficulty in walking home because of stiffness and soreness in his legs. However, his legs were not numb. These symptoms persisted, and he remained away from work for five weeks. At the end of that time there was only a little residual soreness. Two weeks later, five weeks before entry, he was struck in the side and pinned against a wall by a cart containing twenty-five crates of eggs. The ribs of his right side were damaged but not severely enough to keep him from work. His physician strapped his chest, and in the course of a few days the pain wore off. However, at the time of entry he still had pain in his side when he laughed or coughed. Three weeks before entry he began to have dull pain in the upper lumbar region when he sat down, but which disappeared on walking about. About a week later he began to have a dull heavy feeling in his left foot, in the course of three days this spread to both legs with almost complete loss of their function. If he attempted to stand, his knees buckled under him. There was no pain or coldness in his legs, but they felt heavy and numb, with prickling sensations in the

feet. He also had a scalding sensation in the middle of his back when he became overheated, which radiated in a band around his chest. For the week before entry he had involuntary jerking and twitching movements of his legs, which sometimes kept him awake at night. About four days before entry his feet became somewhat swollen. He had no other symptoms of any kind. At the time of entry he was still able to move both legs. He had not lost any weight.

His first wife and two of his siblings had died of tuberculosis about forty years before his present illness. His past history and family history were otherwise negative.

Physical examination revealed a well-developed and nourished man in no apparent discomfort, showing occasional involuntary flexion of his legs. There was marked tortuosity of the retinal arteries, and edema of both lower legs. The general physical examination was otherwise essentially negative. The blood pressure was 170 systolic, 70 diastolic. Neurological examination showed an area of hypesthesia ending at the level of the second lumbar vertebra with absent position and vibration sense in both ankles and feet. Both legs were spastic, and voluntary muscle contractions were weak. The leg reflexes were hyperactive. There was bilateral ankle clonus, and bilateral Babinski signs were present. The examination of the upper part of the body and of the upper extremities was negative. Rectal examination was negative. The prostate felt normal in size and consistence.

The temperature was 98.6°F, the pulse 80. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,100,000 with 90 per cent hemoglobin and a white-cell count of 10,900 with 69 per cent polymorphonuclears, 26 per cent lymphocytes and 5 per cent monocytes. The serum protein was 7.8 gm per cent, and the blood Hinton test was negative. A lumbar puncture showed an initial pressure of 50 mm of water, with respiratory oscillations but without pulse oscillations. Jugular compression elevated the pressure to 60 mm and abdominal compression elevated it to 210 mm. The lumbar spinal fluid was yellow, contained 1200 mg per cent of protein, and had a goldsol curve of 0000022553. A cisternal puncture showed an initial pressure of 80 mm., with normal dynamics except for an elevation to only 110 mm on abdominal compression. The cisternal fluid was clear, contained 12 mg per cent of protein and 83 mg of sugar, and had a 0000000000 goldsol curve. The spinal-fluid Wassermann test was negative. X-ray examinations of the spine showed disappearance of the right pedicle of the eighth dor-

sal vertebra The right side of the body of this vertebra was deformed and less dense than the left side There was thickening of the soft tissues opposite the least dense area There was extensive spur formation about the margins of the lumbar vertebrae, and the right twelfth rib showed evidence of an old fracture Lipiodol injected into the cistern descended to the level of the seventh dorsal vertebra where it met a definite block, the column ending in a pointed extremity The film showing this also showed partial destruction of the pedicles of the seventh and eighth vertebrae and slight wedging of the body of the eighth

On the sixth day he began to have abdominal distention and retention of urine Catheterization yielded 750 cc of urine An operation was performed on the thirteenth day

DIFFERENTIAL DIAGNOSIS

DR SUMNER M. ROBERTS The sudden pain in the patient's left hip is perfectly consistent with a back strain To the layman the hip region includes the whole buttock as a rule, and pain in the buttock, if this is where it was, is a common accompaniment of low-back injuries Soreness in both legs is not so common following injury, but often there is soreness in both buttocks and upper thighs as the result of a fascial strain of the low back His improvement under a five weeks' rest is again consistent with a simple strain

By damaged ribs I suppose they mean broken ribs We are taught that ribs heal in four weeks, but discomfort after five weeks is not unusual, particularly in an elderly man, and injury to the rib cartilages persists much longer than this

He had dull pain in the upper lumbar region, which was improved by walking This is a common story with any mild irritation, infectious or mechanical The patients feel better while walking about, but they pay for their activity later by stiffening up when they sit down So far, except for the soreness in both legs, the history suggests nothing unusual that might not happen to any elderly man with a back strain

Then things began to get serious, and there was rapid loss of power in the legs, with sensory disturbance The scalding sensation in the mid back with radiation around the chest is the first sign we have of any trouble higher than the low-back region His feet became swollen Does this mean any cardiac or renal condition? Not necessarily Swelling and edema are common accompaniments of paralysis, especially of the central-nervous-system type It is particularly common following cerebral accidents

From the history alone we can tell that he has some lesion in the spinal cord or close to it and pressing upon it, with preliminary symptoms simulating a back strain and possibly aggravated by his crushing injury Can he have tuberculosis? This can be dormant for some time with a fairly sudden onset of symptoms, and we know that tuberculosis can cause cord compression This disease is rare at seventy, and all the cases I have seen at this age have had a long history of previous tuberculous trouble in the back A fresh focus at this age is so unlikely that this diagnosis can be ruled out

Paget's disease can cause partial collapse of the vertebrae, but seldom, if ever, results in neurologic symptoms Even if Paget's disease is picked up later on physical examination, I do not think it is the cause of his trouble Senile osteoporosis can cause the collapse of multiple vertebrae The symptoms sometimes are very slight and sometimes very severe Again, however, this condition does not cause cord compression

The most likely explanation for his symptoms is a tumor of or close to the cord and causing pressure symptoms His age and previous good health both support this conjecture The family history of tuberculosis forty years ago does not alter my opinion as to the unlikelihood of this disease's being the cause of symptoms

The general physical examination was negative The apparent normality of the prostate is important Neurological examination suggests trouble at the second lumbar vertebra or a little higher There was nothing neurological to suggest trouble in the dorsal region or to explain his radiating chest pain His general good health is against any generalized metastatic lesion, at least involving important organs The physical examination therefore helps us to localize at least one level of disease in or about the spinal cord, but does not help in making a more detailed diagnosis, and we shall have to depend upon more technical examinations

His lumbar puncture showed block The color and chemistry of the fluid confirm this The lipiodol injection, however, apparently localized the block at the seventh dorsal and not in the upper lumbar region where we rather expected it to be

The x-rays show a destructive process of the seventh and eighth dorsal vertebrae with thickening of the soft tissues on one side The destruction is definite, but covers only a small area, and might well have been missed by a less acute examiner Has he another spinal lesion lower down than the seventh dorsal vertebra? Because of his story of back strain and pain in his hip improving with rest, and because of the sensory disturbance ending

at the level of the second lumbar vertebra, we have had the lumbar region more in mind than the dorsal, which only had one symptom pointing to it. Possibly he has two lesions of a metastatic nature, but the lower lesion is not absolutely necessary. Pressure on the dorsal cord can give leg paralysis without involving the lower trunk or sphincters. This is often seen with tuberculous lesions higher than this. The original hip pain may have been the pain that is sometimes associated with the onset of paralysis due to cord pressure. The ending of the sensory disturbance at the level of the second lumbar vertebra does not fit entirely into the picture, but the definition of sensory levels is not always so accurate as we think it is. Distention and retention of urine simply indicate increasing cord pressure. Operation was done for two purposes—in the hope of relieving cord pressure by laminectomy and for the purpose of biopsy and diagnosis.

We are definitely dealing then with a tumor pressing upon the cord. Is this a metastatic lesion or is it a primary growth? Two metastatic lesions are common at this age—hypernephroma and carcinoma of the prostate. Hypernephroma is an old-age tumor. The spine is the second most frequently involved region, and the presence of metastases may be the first sign of disease. Carcinoma of the prostate commonly involves the spine, and is again a tumor of old age. This patient, however, shows no signs of general metastasis, as is usually the case, and the x-rays are not typical of metastatic carcinoma. They do not show the multiple mottled areas and increased density one would expect to find with a spreading prostatic lesion.

On a percentage basis alone a metastatic tumor, probably hypernephroma, would seem the best bet. However, I think we have no right to argue that way, but must make our deductions entirely on the evidence at hand. Since there is no evidence of any generalized disease, I should prefer to consider a primary tumor to be the cause of his symptoms. The most likely tumors are fibrosarcoma and a very similar tumor of the same group, a neurogenic sarcoma. Both of these tumors erode bones from without inward. Both of them, when occurring in suitable areas, can be shown to cause soft-tissue shadows. The one thing against them is that lesions in the spine are rare. Fibrosarcoma, therefore, is my diagnosis.

PREOPERATIVE DIAGNOSIS

Cord tumor, metastatic?

DR. ROBERTS'S DIAGNOSIS

Fibrosarcoma

ANATOMICAL DIAGNOSIS

Plasma-cell myeloma

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY: That this man suffered from a tumor of, or in the neighborhood of, the spinal cord with secondary pressure upon it was fairly obvious when the findings were all in. The question, of course, concerned the type of tumor. Dr. Roberts has placed his bet upon a primary tumor of a spinal nerve root or the dura, whereas the members of the Neurosurgical Service placed theirs upon a metastatic lesion.

The patient was explored by Dr. Jost Michelsen who did a laminectomy of the sixth, seventh and eighth thoracic vertebrae. He found a soft pinkish extradural tumor about 5 mm thick which was compressing the cord from the outside at this level. A frozen section was made by Dr. Charles S. Kubik who was able to give an immediate diagnosis of myeloma. Dr. Michelsen, therefore, removed as much of the tumor as he could but did not attempt any radical surgery. Since the tumor seemed to be entirely extradural and the dura was pulsating normally he did not open it.

The subsequent fixed sections of the tumor confirmed the diagnosis of plasma-cell myeloma. The tumor is made up almost entirely of rather small, round cells with eccentric round nuclei showing the typical cartwheel distribution of the chromatin. As is often the case, many of the cells contain two and three of these nuclei. Following operation the patient was referred to the X-Ray Department for treatment. He received 2400r in eight 300-r doses, but failed to show any improvement in his symptoms. Perhaps Dr. Hampton will say a word in regard to the treatment.

DR. ALBREY O. HAMPTON: The treatments were given through an 8 by 10 cm. field, centered over the eighth dorsal vertebra, and were completed twenty-two days after the operation. The patient has not been observed since that time.

Some cases of plasma-cell myeloma are quite sensitive to radiation, but many others show very little response. This patient is probably in the latter group.

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PURE FOOD, DRUG AND COSMETIC BILL

THE House Committee on Interstate and Foreign Commerce has reported favorably a highly undesirable bill for the control of foods, drugs and cosmetics—a bill so bad with regard to method of enforcement that it ought to be entitled “a bill to perpetuate impure foods, drugs and cosmetics.” In it, great ingenuity has been shown in making the legal processes so complex and devious that it will be very difficult to get satisfactory enforcement and almost impossible to obtain quick action on any food, drug or cosmetic that is likely to cause serious disease or even death.

The bill is so impracticable in this feature that the Secretary of Agriculture has written a statement including these vigorous words

If a bill containing this provision were enacted, it would not constitute any material contribution to the public protection that the department cannot now extend under the existing law. In some respects it would afford even less protection than that afforded by the existing law, which is broad and general in its terms and is to some degree applicable and effective in the fields covered by the sections involved in this discussion.

It is the department's considered judgment that it would be better to continue the old law in effect than to enact Senate 5 with this provision.

I am of the opinion that if Section 701 (f) remains in the bill its effect would be to hamstring its administration so as to amount to a practical nullification of the substantial provisions of the bill.

If there is to be exploration into new fields of administrative law, may I urge that it not be in the field of vitally important public health legislation.

The above is quoted from the minority report of the House Committee on Interstate and Foreign Commerce, which was signed by six of its members. (It is pleasing to us that the Honorable Pehr G. Holmes, of Worcester, Massachusetts, the only New England member of this committee, signed this minority report.)

In the minority report the following sentence also appears:

Weighing the advantages and disadvantages for the protection of consumer welfare presented by the terms of this bill, we are unable to escape the conclusion that because of the extraordinary provision for court review of regulations in Section 701 (f), which would postpone indefinitely the consumer protection that can now be afforded in some degree by the present law in much of the field to be covered by these regulations, it would be better to continue the old law in effect than to enact Senate 5 with this provision.

It would be to the advantage of the medical profession and lay public to have this present house bill (Senate 5, Report No. 2139 Union Calendar No. 770) defeated unless these objectionable features are eliminated. The original bill as passed by the Senate on March 9, 1937, is greatly to be preferred to the bill as amended in House committee. If the former cannot be passed, then no bill is greatly to be desired. This would leave legislation on pure foods and drugs in its existing form.

Physicians in New England can help to right a bad situation, if they write promptly to their senators and representatives protesting against the ac-

tion of the committee as outlined above and asking a vote against this bill, unless the section dealing with enforcement be restored to the form contained in Senate 5, as already passed by the Senate

JOSIAH MACY, JR., FOUNDATION

THE Josiah Macy, Jr., Foundation in a recent release reports in a six-year review that from its incorporation until December 31, 1936 it has made three hundred and twenty-four grants totaling \$806,681.75. These grants have been made to thirty-four different universities and twenty-seven other agencies of research in the United States, Belgium, Czechoslovakia, France, Germany, Hungary, Netherlands and U S S R.

Dr Ludwig Kast, president of the Foundation, stresses in his foreword to the report the necessity of preserving the unity of the patient as a psychosomatic entity. In the long run, he believes, the effectiveness of any planning depends upon free and enlightened progress within the medical profession. With the increasing number of processes and reactions to be observed and evaluated and the ever-enlarging number of specialists required to observe and evaluate them, the task of adequate diagnosis and effective health care requires a concern for the patient as an individual personality and the sympathetic insight that the family physician of old was able to offer.

There is, moreover, a great need for the further study of growth, development, maturation and aging, not only as a medical problem but as a social and economic one. The trend is now toward the elimination of the older worker from employment, not only because he cannot sustain the pressure of modern occupations, but also because of the availability of younger men and women for a limited if not, indeed, a rapidly diminishing supply of jobs. This situation, it is believed, will give rise to emotional conditions which must find some release and which, in the older group, will probably be expressed in mental and psychosomatic disorders. This—the health care of the aging individual—is one of the most severely challenging medical, social and economic problems that must be faced in future years.

MASSACHUSETTS MEDICAL SOCIETY

GOLF TOURNAMENT

Due to the fact that there has been so much demand for a Golf Tournament to be held in connection with the annual meetings, the Committee of Arrangements has planned to hold one at the Commonwealth Country Club, 91 Algonquin Road, Newton Center, on Wednesday afternoon, June 1.

One group will consist of those members who hold either state or club handicaps, while a Kickers Tournament has been arranged for those who have no handicaps. A trophy, the Massachusetts Medical Society Golf Challenge Cup, presented by one of the members, will be awarded for the low net score, this must be won three times to obtain permanent possession. Other suitable prizes have been secured for net and gross scores in both divisions.

The details of the tournament itself will be attended to by Mr. John Corcoran, of the Massachusetts Golf Association, thus assuring efficient management.

It is hoped by many of the members that a permanent golf organization may be formed within the Society, and some action will undoubtedly be taken during or following the tournament.

PROPOSED AMENDMENTS TO THE BY-LAWS

Due to a typographical error in the pamphlet announcing proposed amendments to the by-laws, Amendment No. 7 reads "Chapter VII, Section 2." This should have read "Chapter VII, Section 11."

ALEXANDER S. BEGG, *Secretary*

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 71 LOW-ATTACHED PLACENTA AT TERM

Mrs. V. D., a twenty-five-year-old multipara, was admitted to the hospital on February 7, 1938, for induction.

The family history was negative and her past history was not important except for a moderately severe attack of pyelitis four weeks after her last confinement in 1936. Catamenia began at thirteen, were regular every twenty-eight days,

A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

and lasted four or five days. There had been two previous normal pregnancies. Her last period was April 22, 1937, making her due for delivery on January 29, 1938.

The prenatal course was normal throughout. She was seen at regular intervals of three weeks.

Upon physical examination at admission she was found to be a well-developed and nourished woman. The lungs were clear and resonant, there were no rales. The heart was not enlarged, and there were no murmurs. The blood pressure was normal. The uterus was enlarged to a size consistent with her dates. The urine was free of albumin. As the patient had gone ten days over term, induction was decided upon. When the patient entered the hospital the evening before induction was planned, she was completely symptom free. She was put to bed after a perineal preparation had been done and promptly went to sleep.

At 2 a. m., five hours after admission, the patient called the nurse and said that her membranes had ruptured. On examination the nurse found the bed soiled with bright-red blood, sufficient to make a stain 30 cm. in diameter. The attending obstetrician was called and found the patient in good condition: the blood pressure was 120 systolic, 70 diastolic, the pulse 90, the fetal heart tones regular, at a rate of 140. The fundus was soft, and there was a small amount of bright-red flow from the vagina. A tentative diagnosis of partial separation of the placenta was made. Immediate grouping of the patient's blood was done, and compatible donors were on hand in case of need.

One-quarter grain of morphine was given, and an abdominal binder was firmly placed over the fundus. The patient was then brought to the delivery room where a careful vaginal examination was done under routine precautions. The cervix was two fingers dilated, soft and nearly completely taken up. Careful examination of the lower segment revealed no placenta and confirmed the diagnosis of separation. The vertex was fitting into the inlet with some forebag, and rupture of the membranes to stimulate labor was decided upon. About 200 or 300 cc. of clear amniotic fluid escaped after puncture of the membranes. To take up the slack after the fundus had decreased in size an additional binder was put over the first one to insure its being held securely and to cause pressure on the cervix. Labor began in about half an hour and progressed steadily. The cervix was fully dilated two and a half hours later, and after one hour of ineffectual second-stage labor a low mid forceps was done, the head being posterior on the right and somewhat extended. A healthy male child weighing 8 lb., 8 oz., was delivered. Pituitary solution, 1 cc., was given intramuscularly, the fundus contracted well, and the placenta was ex-

pressed fifteen minutes after the delivery of the child. There was no unusual flow after the third stage, the fundus remaining firm with no need of further stimulation. The placenta was examined carefully and one-third of the outer margin, to a depth of 1 cm., showed evidence of separation. This apparently was the lower margin since it was nearest the point of rupture on the membranes. The postpartum convalescence was uneventful.

Comment. Because a patient has gone ten days over the expected date of delivery is no real reason for induction. The time of induction should always be based upon the condition of the cervix. Had this patient been examined before she went into the hospital, it would have been determined that the cervix was ready for labor. Many cases ten days before the computed day of labor are not ready to have a baby, as is determined by vaginal examination, which fails to show an obliterated and open cervix. The amount of external bleeding would lead one to infer that a partial separation of a low-attached placenta was the cause of the hemorrhage. It is uncommon to have a large amount of external bleeding when a normally situated placenta becomes separated. A vaginal examination is the only way to determine specifically the source of the bleeding. In this case no placenta was felt, and the diagnosis of partial premature separation was made. The treatment was ideal. As it is not stated that the patient was definitely in labor, it is fair to infer that she was not in labor, the vaginal examination which showed the cervix to be dilated two fingers is perfectly compatible with the physiologic change that occurs late in pregnancy. The separation of a low-attached placenta is undoubtedly the commonest cause of bleeding in cases that are close to term.

GREEN LIGHTS TO HEALTH

SPONSORED BY THE MASSACHUSETTS MEDICAL SOCIETY AND
THE MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

COURTESY WAAB — WEDNESDAYS, 8 15 P. M.

May 18 — Epilepsy William G. Lennox
May 25 — Scurvy — Infantile Richard C. Eley
June 1 — Nose and Throat Charles T. Porter
June 8 — Tuberculosis Frederick T. Lord
June 15 — Medical Ethics David Cheever
June 22 — Fads in Medicine Shields Warren
June 29 — Diabetes Reginald Fitz

DEATH

MORROW — CHARLES H. MORROW, M.D., of Gloucester, died May 2. He was in his seventy-eighth year.

A native of Gloucester, he received his medical degree from the University of Pennsylvania School of Medicine in 1885, went to Gloucester shortly afterward and practiced there for fifty-three years. Dr. Morrow was at one time on the staff of the Addison Gilbert Hospital. He was a fellow of the American Medical Association and

of the Massachusetts Medical Society and a member of the Masonic Order

MISCELLANY

PETER BENT BRIGHAM HOSPITAL ANNIVERSARY

On May 5, 6 and 7 a celebration of the twenty fifth anniversary of the opening of the Peter Bent Brigham Hospital for the reception of patients was held at the hospital in conjunction with a reunion of graduates of the professional and nursing services of the hospital

On each of the three days up to 10 30 a. m. various hospital demonstrations ward visits and surgical operations were conducted. After this there was a program of scientific and nursing papers,—more than one hundred in number,—presented by graduates and present members of the hospital professional and nursing staff

On the forenoon of May 7 there was a very large public meeting at which the Rt. Rev. William Lawrence Bishop Emeritus of the Episcopal Diocese of Massachusetts, gave the invocation, His Excellency Charles F. Hurley, Governor of the Commonwealth, gave the Greetings of the State, His Honor Maurice J. Tobin Mayor of Boston, the Greetings of the City of Boston, Dr. Dean Lewis, first surgeon-in-chief pro tempore of the Peter Bent Brigham Hospital, surgeon-in-chief of the Johns Hopkins Hospital, the "Greetings of the Medical Profession," and President James B. Conant, Harvard University the "Greetings of the University." Dr. Henry A. Christian, physician-in-chief of the Peter Bent Brigham Hospital and Hersey Professor of the Theory and Practice of Physic in the Harvard Medical School, made an address entitled "A Hospital Comes to Town. The story of the Peter Bent Brigham Hospital in Boston." Dr. Elliott C. Cutler, surgeon-in-chief of the Peter Bent Brigham Hospital and Moseley Professor of Surgery in the Harvard Medical School, an address entitled "A Surgeon Looks at the Record" and Dr. C. Sidney Burwell, physician at the Peter Bent Brigham Hospital and dean of the Faculty of Medicine of Harvard University, one entitled "The Future of the Hospital." The benediction was pronounced by the Rt. Rev. Francis L. Phelan, chancellor of the Archdiocese of Boston. These exercises were followed by a luncheon on the hospital grounds for all invited guests.

On each afternoon of these three days, tea was served on the hospital lawn. On the evening of May 5 a musical comedy was given at the hospital by the resident professional staff. On the evening of May 7 there was a dinner for four hundred at Vanderbilt Hall, Harvard Medical School, followed by a dance at Longwood Towers, Brookline. At all these events of the celebration the graduates were the guests of the trustees of the Peter Bent Brigham Hospital.

FOURTH ANNUAL RURAL HEALTH CONSERVATION CONTEST

In the Rural Health Conservation Contest, conducted annually by the Chamber of Commerce of the United States in co-operation with the American Public Health Association, the winner for 1937 in the Northeastern Division was recently announced to be Columbia County, New York, and awards of merit go to Barnstable County, Massachusetts Saginaw County, Michigan Southern Berkshire District, Massachusetts Cortland County, New York

Macosta-Osceola Health Unit, Michigan, Richland County, Ohio, and Ottawa County, Michigan.

Some of the points considered by the committee of health experts entrusted with making the awards are (1) the extent to which the water supply is protected, (2) the point at which sanitation has advanced in rural homes, (3) the safety of the milk supply, (4) adequate care of prenatal cases, (5) medical supervision of infants, (6) the availability of well trained nursing service, (7) the degree in which local physicians and dentists aid in the public health program (8) activities to control tuberculosis and syphilis.

NOTICES

BOSTON CITY HOSPITAL

There will be a symposium on traumatic surgery in the Thorndike Amphitheater, Boston City Hospital, on Saturday, May 21, at 10 30 a. m.

bone and Joint Injuries. Dr. Otto J. Hermann.
Abdominal Injuries. Dr. William R. Morrison
Pathology of Brain Injuries. Dr. Timothy Leary
Clinical and Surgical Aspects of Brain and Spinal Cord Injuries. Dr. Donald Munro.

CHARLES M. GREEN, M.D., *Chairman*
Committee on Hospital Clinics.

TRUDEAU SOCIETY

The annual meeting of the Trudeau Society will be held at the Middlesex County Sanatorium, Trapelo Road, Waltham, on Tuesday, May 17, at 4-00 p. m.

PROGRAM

The State's Experience with Silicosis. Mr. Manfred Bowditch
Results in a Series of Internal Pneumonolyses using Electrosurgery. Dr. Harlan F. Newton
Bronchial Complications among Tuberculous Patients. Dr. Lowrey F. Davenport.
Spontaneous Pneumothorax. A suggestion for the treatment of acute symptoms. Dr. Francis P. Dawson.

MOSES J. STONE, M.D., *Secretary*

CARNEY HOSPITAL

Clinical exercises in observance of the seventy fifth anniversary of the founding of the Carney Hospital, under the direction of the Sisters of Charity, will be held on Tuesday and Wednesday, May 17 and 18

PROGRAM

TUESDAY

9 15 a. m. — Operations.
First Surgical Service, Dr. A. McH. Fraser
Gynecological and Obstetrical Service, Dr. L. E. Phaneuf.
Urological Service, Dr. Roger C. Graves.
10 00 to 11 30 a. m. — Medical ward rounds, Dr. L. F. Curran and associates.
2 00 to 4 45 p. m. — Series of short papers will be read by various members of the several services at the hospital.

WEDNESDAY

9 15 a. m. — Operations.
Second Surgical Service, Dr. W. E. Browne.
Orthopedic Service, Dr. W. R. MacAusland.

10 00 to 11 30 a m — Medical ward rounds, Dr L F Curran and associates.
 2 00 to 4 45 p m — Series of short papers
 8 15 p m Dr Henry A Christian will read a formal paper "Glomerular Dominance in Bright's Disease." This meeting will be held at John Hancock Hall, 90 St. James Avenue, Boston.

Members of the medical profession are cordially invited to attend these exercises. Further information concerning this program can be obtained by calling SOU 2070

WILLIAM E BROWNE, M.D., *Secretary*,
 Advisory Board, Carney Hospital

NEW ENGLAND SOCIETY OF PHYSICAL MEDICINE

The annual meeting of the New England Society of Physical Medicine will be held at the Hotel Kenmore, Boston, on Wednesday evening, May 18, at 8 o'clock.

The council will meet at 6 00, and the informal dinner will be held at 6 30

PROGRAM

Reports of officers and committees.

Election of officers

Address After-Treatment of Poliomyelitis Dr Kristian G Hansson, director of physical therapy, New York Hospital

All members of the medical profession are cordially invited to attend

WILLIAM D McFEE, M.D., *Secretary*

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

The next meeting of the Boston Society of Psychiatry and Neurology will be held at the Boston Medical Library, on Thursday evening, May 19, at 8 15

PROGRAM

Intracranial Aneurysms Dr C A McDonald and Mr Milton Korb

The Vascular System of the Human Spinal Cord Dr T H Suh

A Method of Measuring Consciousness in Petit Mal Epilepsy Dr R S Schwab

A Case of Mucous Colitis Its psychiatric manifestations Dr M Yorshis

H. HOUSTON MERRITT, M.D., *Secretary*

NEW ENGLAND PATHOLOGICAL SOCIETY

The annual meeting of the New England Pathological Society will be held at the University Club, Thursday, May 19, at 6 30 p m.

Dr Robert A Moore of Cornell University Medical College will speak on Benign Enlargement of the Prostate.

J B HAZARD, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MAY 16

TUESDAY MAY 17

Clinical exercises in observance of the seventy fifth anniversary of the founding of the Carney Hospital

*9 10 a m Boston Dispensary Pathogenic Fungi Dr Jacob Swartz
 9 30 a m Massachusetts General Hospital Thoracic clinic Ether Dome
 *10 a m 12 30 p m Tumor clinic Boston Dispensary
 *12 m South End Medical Club Headquarters of the Boston Tuberculosis Association 554 Columbus Avenue, Boston

WEDNESDAY MAY 18

*Clinical exercises in observance of the seventy fifth anniversary of the founding of the Carney Hospital

8 a m Massachusetts General Hospital Grand rounds Orthopedic Department

*9 10 a m Boston Dispensary Hospital case presentation Dr S J Thannhauser

12 m Boston Society for the Advancement of Gastroenterology Cheever Amphitheater Boston City Hospital

*12 m Clinicopathological conference. Children's Hospital amphitheater

*8 p m New England Society of Physical Medicine. Hotel Kenmore.

THURSDAY MAY 19

8 a m Massachusetts General Hospital Circulatory clinic rounds.

*9 10 a m Boston Dispensary Erythema Nodosum Dr George E. Currier

11 a m Massachusetts General Hospital Medical grand rounds

12 m Massachusetts General Hospital Clinicopathological conference.

6 30 p m New England Pathological Society University Club

8 15 p m Boston Society of Psychiatry and Neurology Boston Medical Library

FRIDAY MAY 20

*9 10 a m Boston Dispensary Hemolytic Streptococcal Infections Factors of Significance in Prognosis and Treatment Dr Chester S Keefer

10 a m Massachusetts General Hospital Fracture rounds

*10 a m 12 30 p m Tumor clinic Boston Dispensary

SATURDAY MAY 21

*9 10 a m Boston Dispensary Hospital case presentation Dr Thannhauser

*10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A Christian

*Open to the medical profession

MAY 12 — National Hospital Day Page 788 issue of May 5
 MAY 16 and 17 — American Neurological Medical Society Page 582 issue of March 31

MAY 17 — South End Medical Club Page 788 issue of May 5

MAY 17 — Trudeau Society Page 825

MAY 17 and 18 — Clinical exercises in observance of the seventy fifth anniversary of the founding of the Carney Hospital Page 825

MAY 18 — Brookfield Medical Club Page 788 issue of May 5

MAY 18 — Boston Society for the Advancement of Gastroenterology Page 788 issue of May 5

MAY 18 — New England Society of Physical Medicine Notice above

MAY 19 — New England Pathological Society Notice above.

MAY 19 — Boston Society of Psychiatry and Neurology Notice above

MAY 21 — Boston City Hospital Symposium on Traumatic Surgery Page 825

MAY 31 JUNE 1 and 2 — Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston

JUNE 1 and 2 — National Society for the Advancement of Gastroenterology Page 746 issue of April 28

JUNE 6 7 8 and 9 — American Association of Industrial Physicians. Page 499 issue of March 17

JUNE 10 and 11 — American Heart Association Page 707 issue of April 21

JUNE 13-17 — American Medical Association San Francisco

JUNE 13 OCTOBER 8 and NOVEMBER 15 — American Board of Ophthalmology Page 282 issue of February 10.

JUNE 23 — Penituckett Association of Physicians. Hotel Bartlett 95 Main Street Haverhill 8 30 p m

SEPTEMBER 12 14 — American Association for the Study of Gonorrhea Page 545 issue of March 24

OCTOBER 17 21 — Clinical Congress of the American College of Surgeons New York City

OCTOBER 24 26 — Academy of Physical Medicine Scientific Session Washington D.C.

DISTRICT MEDICAL SOCIETIES

HAMPDEN

Meeting will be held on the fourth Tuesday in July

PLYMOUTH

Meetings will be held at 11 a m on May 19 and July 21

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NUMBER 20

SOME NEWER ASPECTS OF THE ALCOHOL PROBLEM

TIMOTHY LEARY, M.D.*

BOSTON

RECENT developments in our scientific knowledge of the effects of alcohol, and the increase in the mortality from alcoholism in this jurisdiction since the repeal of prohibition, make it desirable to review the subject again.

The effects of alcohol in general are referred to in an earlier paper, and need not be considered in detail here.¹ It is now generally accepted that alcohol is a narcotic and not a stimulant. Its apparent stimulant action arises because of its narcotic effect on the cerebral cortex, which serves as an inhibiting brake on the lower cerebral centers. The release of this brake, which is responsible for our conventionalism, our self-consciousness and our inferiority complexes, frees the emotional centers, which then come into control of the activities of the individual. Judgment is warped, muscular co-ordination and technic are lowered.

The term "narcotic" has a sinister connotation to the average mind. It suggests opium, cocaine, chloral and other habit-forming narcotics, but it includes the more benevolent barbiturates and similar agents, to which the world turns, perhaps too constantly, for relief.

Animal experimental evidence of the harmful effects of alcohol is quite limited. Pearl, who in 1914 was a biologist at the University of Maine, had a group of pedigreed chickens on which he studied the toxic effects of alcohol. The exposure was to an atmosphere of alcohol vapor for one hour a day, six days per week. At the end of fifteen months 41 per cent of the control animals were dead, owing largely to an epidemic of roup. None of the alcoholized animals had died. The experiment terminated in 1917, at which time all but one of the alcoholized animals survived. 'Meantime,' said Pearl, "all of their control brothers and sisters had long since died." The control animals, on the other hand, were more fertile than the alcoholic group.

A further study was made of the character of the offspring, thirteen desiderata being considered. Of these useful qualities the alcoholic offspring were superior in nine, the nonalcoholic in two, and in relation to two there were no differences. Chicken fanciers who were called upon to pick the superior animals among the offspring of both groups made selections without knowing the sources of the animals. Ninety per cent of their selections were from the offspring of alcoholic animals.

Pearl² concluded that the lowered fertility of the alcoholic group was due to a selective toxic action on feeble germ cells. Only strongly resistant germ cells produced fertile eggs.

Stockard³ repeated these experiments with guinea pigs. There was a higher mortality in the young among the alcoholic offspring in the early generations and some defective animals in the third generation. In the fourth generation and thereafter, however, there was produced a superior race of guinea pigs, whose mortality was only 64 per cent of the controls. He agreed with Pearl that alcohol apparently had a toxic action upon feeble germ cells, leaving the stronger cells to produce offspring. Stockard concluded:

If we should desire to apply these experimental results to the human alcoholic problem it might be claimed that such elimination of unfit individuals had benefited the races of Europe, since all of the dominant races have a definite alcoholic history.

Apart from the evidence of the toxic influence of alcohol on feeble germ cells, the only effects of ethyl alcohol on experimental animals are as follows: (1) acute intoxication, which may be carried to a fatal issue, (2) a lowering of the resistance to infection in rabbits fed concentrated alcohol by mouth (see below), and (3) an apparent activating influence on the toxic effect of certain poisons.

The dosage of carbon tetrachloride necessary to produce fatal results is markedly lowered in ani-

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imals which have been fed alcohol Mallory⁴ has found that alcohol lowers the dosage of phosphorus necessary for toxic action. Carbon tetrachloride is soluble in water only in traces. Phosphorus (yellow) is practically insoluble. Alcohol is a perfect solvent of carbon tetrachloride, and dissolves phosphorus in amounts adequate to produce toxic action. It is strongly suggested that the solvent action of alcohol is the factor responsible for the increased toxicity of both these agents.

On the other hand, mice may have as their only source of fluid from birth 35 per cent alcohol, and still develop equally with normal controls.⁵

In contrast to the limited effects created in experimental animals, alcohol has been accused of producing in man a great series of pathologic conditions, as follows:

- 1 Acute intoxication—which need not be discussed
- 2 Delirium tremens

There is doubt whether this symptom is of purely alcoholic causation. It does not arise commonly in relation to simple acute alcoholism. Prolonged usage with limitation of diet is the usual history. (See alcoholic neuritis, No 4.) In the chronic alcoholic, delirium tremens may be precipitated by minor injuries or shocks.

3 Alcoholic epilepsy

Alcoholism can precipitate epileptic attacks in old epileptics, and may possibly initiate attacks in individuals who never had attacks. In practically all such cases the subjects are chronic alcoholics. (See psychoses, No 6.)

4 Alcoholic neuritis

In this group, modern thought tends to accuse B₁ avitaminosis as the factor responsible for much if not all the symptom picture. The alcoholic who exhibits these symptoms usually eats little during his debauches or limits his diet to single foods, for example baked beans or spaghetti. The development of avitaminosis may arise from interference with absorption of vitamins in food. The condition may be due to the combined effects of alcohol and avitaminosis, but the cures of neuritis in patients under treatment with vitamin B₁ and given their usual daily intake of large amounts of whisky⁶ do not support these theories.

5 Korsakoff's syndrome

The neuritic elements in this condition apparently owe their origin to B₁ avitaminosis. For discussion of the psychoses see No 6.

6 Psychoses

The evidence signifies that an impaired mental mechanism tends to lead to alcoholic excess. Drunkenness may be merely the herald—the only obvious sign—of incipient mental disorder. Alcohol may be the intensifier, perhaps, but not the cause. Experience in England suggests that intolerance to small amounts of alcohol may be considered a fairly certain sign of impaired mental equilibrium. English inland and agricultural counties show a low incidence of alcoholism and a high insanity rate. In contrast, maritime, manufacturing and mining counties, above all others the most intemperate, have the lowest rates for insanity.

Pearson and Elderton⁷ concluded that the family histories from the Galton Laboratory studies of adult alcoholism “seemed to indicate definitely that *extreme* alcoholism was only consequent on the pre-existing degeneracy of the stock, it was not in itself an antecedent to such defectiveness.”

7 Degeneracy of offspring

Pearson, with Elderton⁸ of the Galton Laboratory, made a study of random samples of normal children and the offspring of alcoholics in Edinburgh and Manchester. The children of alcoholic parents showed a higher mortality, probably due to lack of care. There was a greater fertility, or at any rate a higher birth rate, in the families of alcoholics, and the surviving families were hardly smaller than those of the sober. Children of alcoholic parents were more healthy (perhaps more hardy) than those of abstainers. He concluded “Parental alcoholism is not the source of mental defect in the offspring.” The relationship between parental alcoholism and filial intelligence is so slight that even its sign cannot be determined in the present material. These findings resulted in bitter attacks on the Galton Laboratory, and on Pearson, by the organized “temperance” groups. They quoted from MacNicholl,⁹ Laitinen,¹⁰ Bezola¹¹ and Demme,¹² who had found apparently conclusive evidence in the opposite direction. I recommend highly the study of Pearson's reply,¹³ which is a brilliant piece of medical polemic. He dissected the statistics of the above-mentioned writers and demonstrated that their studies were not made scientifically, that deductions were in many cases absurd on the basis of the material studied and that their work was valueless. Since Pearson's studies we have heard less of the influence of alcoholism in producing degeneracy.

8 Various central nervous lesions

The standard textbooks in neurology are filled with accusations that alcohol is the cause of multiple lesions. Many of the imputations are pal-

pably absurd. For example, thickening and sclerosis of the skull, atrophy of the brain, decrease in the size of the corpus striatum and atrophy of ganglion cells can hardly be ascribed to alcoholism. To one who has seen a brilliant lawyer go through an amazing number of debauches during which the evidence of acute mental upset was complete, and then has observed his return to the courtroom with his cleverness unimpaired, the indictment of alcohol as a cause of definite organic changes in the brain is difficult to accept. Grinker¹⁴ includes *plaques jaunes* as of alcoholic origin. These are of course traumatic in origin. Myelin sheath degeneration suggests B₁ avitaminosis. Optic neuritis is related to methyl alcohol rather than to ethyl alcohol. Proliferation of glia is usually a repair phenomenon which may be due to many causes. To assign its causation to alcohol without supporting data is unjustifiable. In a word, there is little evidence that alcohol per se is the cause of any organic lesions of the central nervous system. Its functional effects may be very great, but the production of permanent lesions is from the modern viewpoint not proved.

9 Subarachnoid hemorrhage

10 Subdural hemorrhage (without contusion or laceration of the brain)

11 Hemorrhage into mammillary bodies

12 Wernicke's polioencephalitis hemorrhagica superior

This group (Nos 9 to 12) of hemorrhagic conditions is often assigned to alcoholism. The evidence with reference to alcoholic association with subarachnoid hemorrhage is weak. Hemorrhages in this condition are commonly arterial, while the hemorrhages in the other conditions are of venous or capillary origin. Recent investigations indicate that in the latter three conditions we are dealing with C avitaminosis usually accompanying alcoholism and arising because of the limited diet. In subdural hemorrhage, which is by far the commonest of these conditions, the usual source of the bleeding is the rupture of a bridging or arachnoid vein, and falls usually precede the hemorrhages. Changes in the vessel wall, such as are met with in scurvy, predispose to rupture of vessels from minor traumatism such as are frequently sustained without hemorrhage by the average individual.

13 Pellagra

The causal relation of this disease to alcoholism was negatived by the finding of widespread pellagra in fanatical Volstead communities in the South. The limited diet of the chronic alcoholic may lead to B₂ (G) avitaminosis, as is true of the limited

diet of poverty, notably the corn-meal diet in the South.

14 Atrophic gastritis and pernicious anemia

Achlorhydria may arise in chronic alcoholics, possibly because of the insult to the gastric mucosa by the ingestion of concentrated alcohol. Atrophy of the gastric mucosa is not found in most cases of chronic alcoholism. Evidence that pernicious anemia occurs more commonly in alcoholics than in the rest of the population is lacking.

15 Increase in the efficiency of poison agents

The solvent action of alcohol is probably accountable for the apparent increased toxicity. (See above.)

16 Laceration of the cardiac orifice with hemorrhage

17 Pancreatic necrosis

Laceration of the cardia may arise from forceful vomiting and may lead to serious or fatal hemorrhage.¹⁵ This condition, fortunately, is not common. That violent vomiting may be a causative factor in relatively rare cases of pancreatic necrosis would appear from the studies of Myers and Keefer.¹⁶ Readers should be warned, however, that pancreatic malacia, as well as gastric malacia, arises rapidly post mortem in alcoholic bodies, and postmortem gas-bacillus activities are common and early.

18 Lowered resistance to infection

Abbott¹⁷ demonstrated that prolonged alcoholic intoxication (50 per cent alcohol per os) caused a marked increase in the susceptibility of rabbits to certain types of infection, and others have confirmed his findings. With Bergey¹⁸ he later demonstrated that in alcoholized rabbits there was a reduction of complement and specific hemolytic receptor. From personal observation I can support these conclusions with reference to increased susceptibility to infection in rabbits fed concentrated alcohol. This is in contrast to the observations of Pearl in chickens exposed to alcohol vapor.

It is recognized that acute lobar pneumonia occurs frequently in alcoholics. Whether exposure or other factors, including avitaminosis, contribute to this apparent susceptibility is not determined. The high mortality in pneumonia in alcoholics is well known, and routine treatment of pneumonia with alcohol apparently adds to the death rate.

19 Cirrhosis of the liver

20 Chronic nephritis

21 Arteriosclerosis

For years these diseases (Nos 19 to 21) were

looked upon as of alcoholic causation Welch¹⁹ said in 1903 "The experimental reproduction in animals of certain of the more characteristic diseases of human beings, attributable to the abuse of alcohol, such as cirrhosis of the liver, chronic Bright's disease and arteriosclerosis, has not been satisfactorily attained"

The work of Mallory¹ demonstrates that ethyl alcohol is not the cause of so-called alcoholic cirrhosis, either the pure type or the pigment type The indications are that alcohol serves as a solvent carrier of the toxic agent, which proved to be copper in the pigment type

The claim that chronic nephritis may be caused by alcohol has been practically dissipated by modern studies of nephritis Indeed some writers believe that alcohol, while an intoxicant, is also a detoxicant, ridding the body of deleterious catabolic poisons (Hultgren²⁰) There is no acceptable evidence that ethyl alcohol produces nephritis, all the supporting data being based upon inference and not on fact However, MacNider,²¹ while unable to produce any evidence of kidney injury in dogs with pure ethyl alcohol, did produce kidney damage with a *fresh* distillate of fermented corn meal and sugar This may be significant in the period since the repeal of prohibition, as so-called whisky even no older than one month has been sold freely in the market

It is perhaps unnecessary to deal with the evidence that has accumulated which indicates that alcohol is not only not the cause of arteriosclerosis but may even have preventive action on its development¹

22 Shortening of life expectation

The studies of Pearl in this relation are well known and need little comment here His studies of random samples of the population led to the conclusion that while the excessive drinker tended to have a shorter life, owing to fatal acute intoxication or accidental causes, the work "gave no evidence that the expectation of life from age 30 on is in any case impaired by the moderate consumption of alcoholic beverages" These findings have been criticized with apparent justice on the ground that the teetotaler was frequently a strenuous, active, driving sort of fellow—an intemperate enthusiast—while the moderate drinker was a person exhibiting self-control, and should have a higher expectation of life than the immoderate zealot

23 Hemorrhagic gastritis

For years so-called "temperance" literature was illustrated by pictures of the horrible hemorrhagic

changes produced in the stomach by alcohol These changes arise post mortem in the form of a malacia, which the gastric mucosa and the pancreas undergo frequently in alcoholics It is not a vital picture

24 Spontaneous combustion

In the *Thousand and One Nights* it is recorded that jinns and afreets together with their victims sometimes suffered death by spontaneous combustion That this form of death should be seriously accepted as a method of termination of life among alcoholics is on the face of it absurd Charles Dickens, however, approved of it as a perfectly reasonable phenomenon *Bleak House*, as with his other books, was published in installments The description of the death of the alcoholic law writer, Krook, nicknamed the Lord Chancellor, from spontaneous combustion led to criticisms of the creditability of this chapter In his preface to the completed work Dickens attempted to answer these criticisms He asserted that about thirty cases of spontaneous combustion were on record He cited the famous case of Countess Cornelia de Bandi Cesenati in 1731 and stated "The appearances beyond rational doubt observed in that case are the appearances observed in Mr Krook's case", and again "I shall not abandon the facts until there shall have been a considerable spontaneous combustion of the testimony on which human occurrences are usually received"

Oliver²² has recently looked into the literature of this subject, which received much attention during the latter part of the eighteenth and the early part of the nineteenth century Women were the usual subjects, fat, asthenic and over sixty years of age Kopp²³ cited eighteen cases, three or four of which he had personally known about He believed that the fire was started by an electric spark such as could be produced by rubbing fur in the cold Dupont²⁴ asserted that some men could send forth light and sparks from their eyes, and concluded that an internal fire producing these phenomena ignited the body

It is presumable that the common use of candles and open fires, the carelessness of the alcoholic with reference to lights and fires, the tendency of alcoholic bodies to undergo rapid postmortem changes, with the evolution of inflammable gas from gas-bacillus activities, and the imagination of observers are accountable for the reported cases At any rate, cases of spontaneous combustion have not been recorded in the modern period

With the exclusion of the organic lesions attributed to alcohol without adequate basis, and the elimination of the bogeys of hemorrhagic gas-

tritis and spontaneous combustion, it becomes evident that the conditions due to alcoholism in the human being correspond to those which can be produced in experimental animals, namely, acute intoxication, lowering of resistance to infection (concentrated alcohol by mouth) and reinforcement of the action of certain poisons by favoring solution

Now that we are on a firm basis with reference to what alcohol directly does in the human body, we may consider more honestly the injury which it is proved to cause in humankind. It should be kept in mind that alcohol is responsible for estab-

injuries (other than automobile) directly resulting from alcoholism. The years 1916 and 1917 were the "silk shirt" period, when wages were high and employment in producing war supplies for the Allies and ourselves was at its height. We had entered the War in 1917. In 1918 and 1919 patriotic demands for retrenchment and temperance led to a marked lowering of the death rate. A man who became drunk publicly was ostracized, and a drinker could not hold a job. We became one of the most temperate people in the world. Then prohibition was established. The low death rate in 1920 was due to the nonavailability of supplies of liquor. The demand was met in 1921 and 1922 by home-brewing and the use of alcoholic extracts (Jamaica ginger, vanilla, bay rum, and so forth). By 1923 an efficient, if illegal, supply of bootleg alcoholic fluids was available, and this continued during the prohibition era. It was as easy to smuggle a bottle of whisky or concentrated ethyl alcohol as it was to smuggle a bottle of beer,

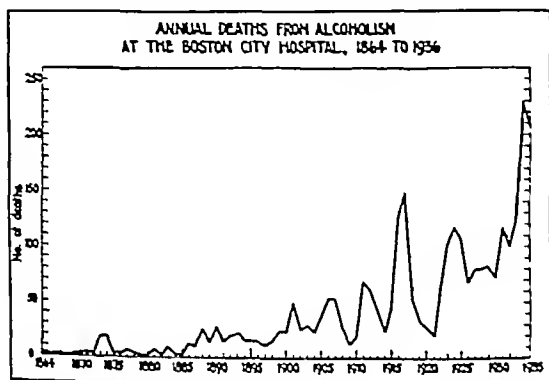


Chart 1

lishing the conditions which favor the production of avitaminoses, it may precipitate the development of psychoses, it is the carrier of the agents producing cirrhosis, it alone or with avitaminosis is accountable for the vomiting which may cause lacerations of the cardia and pancreatic necrosis.

The social effects upon the victims of alcoholism and their families we need not review. However, the tremendous local increase in alcoholism since the repeal of prohibition and the evidence that this increase is largely among the poor present a problem that must be met. This evidence appears in the accompanying charts.

Chart 1† gives the record of annual deaths from alcoholism at the Boston City Hospital, and illustrates the abnormally high death rate in 1934 and 1935, since the repeal of prohibition. (Compare Chart 4.)

Chart 2 shows the annual deaths from conditions related to alcoholism in the Southern Medical Examiner District of Suffolk County, it illustrates the increased number of deaths arising in my personal service as medical examiner*. In the period up to 1915 there was a quite standard low death rate from conditions related to alcohol—including pure alcoholism, alcoholic pneumonias, and

DEATHS RELATED TO ALCOHOLISM

MEDICAL EXAMINER SERVICE — SUFFOLK COUNTY—SOUTH P.

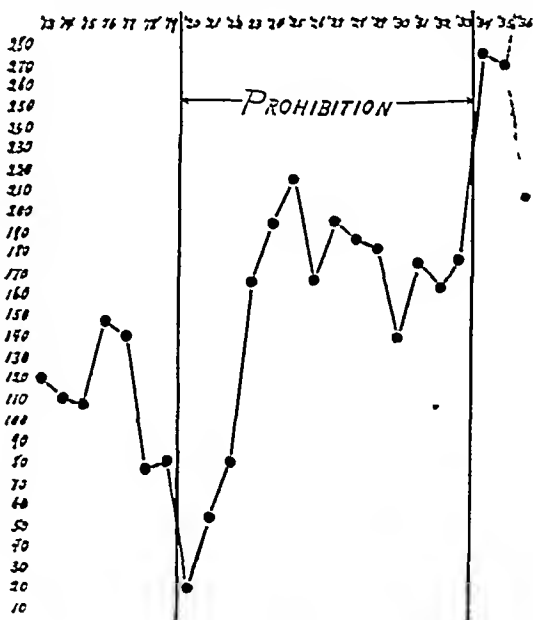


Chart 2

and the profits were greater with concentrated liquors. Prohibition developed in the American people a taste for hard liquor and a disrespect for law.

With the repeal of prohibition there was an increase in local deaths in contrast to a lowering of the mortality from alcoholism in other parts of the country. From police reports and the liquor bottles found on alcoholic patients it became evi-

†Reprinted through the courtesy of Moore M. and Gray M. G. The problem of alcoholism at the Boston City Hospital. New Eng J Med 17:351-358 1937.

*Because of illness in 1936 I saw fewer cases. The percentage of cases of alcoholism actually seen applied to the average number of cases seen per annum would indicate a mortality of 315 for 1936.

dent that this increase in mortality was due largely to the drinking of grain alcohol, though some of the makeshift whiskies sold since the repeal of prohibition played an important part. Massachusetts law permits the sale of 95 per cent alcohol (190 proof) over the counter in drugstores without a prescription. Properly diluted at the beginning of a debauch, this was frequently used in greater strength as drunkenness came on. The presence in the blood or brain of 0.5 per cent of alcohol ensures a fatal outcome.

Chart 3* gives the record of deaths from alcoholism in New York City and shows a drop in the

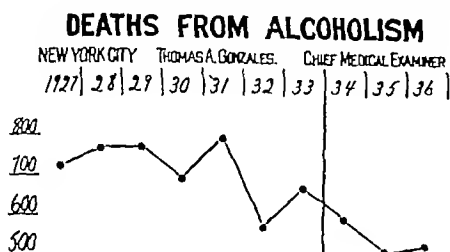


Chart 3

mortality since prohibition. (The low death rate in 1932 was probably due to the widespread publicity given to the deaths resulting from drinking methyl [wood] alcohol, which occurred during 1930 and 1931.)

These charts indicate a marked *increase* in the mortality from alcoholism at the Boston City Hospital since the repeal of prohibition (Chart 1), a marked *increase* in the mortality from conditions related to alcoholism in the Southern Medical Examiner District of Suffolk County since the repeal of prohibition (Chart 2), and a *decrease* in the deaths from alcoholism in New York City since the repeal of prohibition (Chart 3). Ethyl alcohol can be purchased in New York State only on a physician's prescription.

The conclusions are obvious. The drugstore sale of ethyl alcohol over the counter in Massachusetts should be stopped.

A second series of charts illustrates the contrast between admissions for alcoholism to a free public clinic and the admissions to a pay clinic.

Chart 4 presents the Boston City Hospital's record of admissions for alcoholism. It illustrates the continued high curve since the repeal of prohibition, necessarily limited since repeal by the crowded condition of the institution.

Chart 5 shows admissions to the Washingtonian Home, an institution for inebriates with a curve contrasting with that of Chart 4. In 1928 a rule was put into effect that inmates should pay twenty dollars per week in advance. In 1929 and since

that time the home has been closed one month each year. That month was August, the month in which there were fewest admissions. I have divided the eleven-month record of admissions by 11 and multiplied the quotient by 12, placing dots

ADMISSIONS FOR ALCOHOLISM BOSTON CITY HOSPITAL.

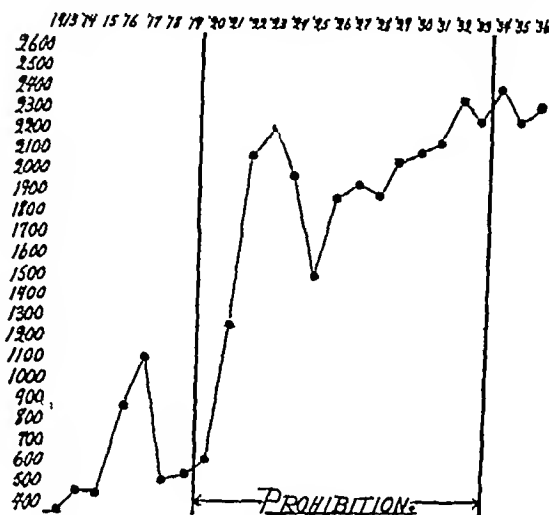


Chart 4

above the curve of actual admissions. It will be noted that granting full allowance for the twelve-month period there is no essential change in the curve.

These charts demonstrate a *high* incidence of admissions for alcoholism to the Boston City Hos-

ADMISSIONS FOR ALCOHOLISM WASHINGTONIAN HOME.

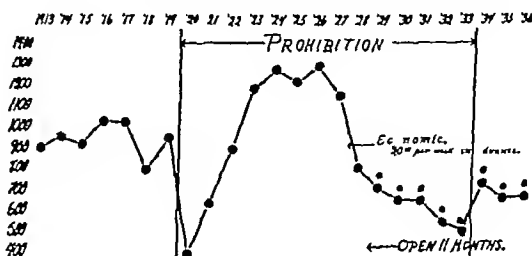


Chart 5

pital since the repeal of prohibition (Chart 4), and a *low* incidence of admissions to the Washingtonian Home under requirements of payment for service in advance (Chart 5).

These contrasting records indicate that the increase in alcoholic admissions to the Boston City Hospital is due to alcoholism among the poor. There is supporting evidence that cash advanced by the City of Boston under welfare provisions is used to buy the ethyl alcohol responsible for

*Reproduced through the courtesy of Dr. Thomas A. Gonzales, chief medical examiner, New York City.

much of this increase in drunkenness. Again the conclusions are obvious. That money advanced by the Welfare Department of the City of Boston should be the means of debauching and killing among the poor is monstrous.

It has been assumed by superior persons that the deaths in this series occurred only among derelicts—human outcasts, for whom nobody cared. Out of 310 deaths in 1937 the bodies of all but 18 were buried by relatives, their estates or their friends. The depression has been an important factor in undermining character, and alcohol as an escape mechanism has been too readily available for all groups, including often the former wage earner of a family.

ALCOHOLISM A PUBLIC HEALTH PROBLEM

In colonial and provincial times, and in the post-revolutionary period as well, the drinking of alcoholic beverages was common and proper. Cider of varying degrees of hardness was supplied to students at Harvard as a matter of course. Rum, for whose manufacture New England was famous, was used freely.

The so-called "temperance" movement began in the decade 1830-1840. Pews in the churches were not filled, and a new slogan was needed to awaken the apathetic public. Bradford has said "The puritan cultivates a sense of sin as the artist cultivates a sense of beauty." And so there was born a new sin—not drunkenness, but drinking. The "temperance" movement became a total abstinence crusade.

It was in this period that De Tocqueville wrote (in *Democracy in America*) "If an American were condemned to confine his activity to his own affairs he would be robbed of one half of his existence, he would feel an immense void in the life which he is accustomed to lead and his wretchedness would be unbearable."

Alcohol the *spirit* by its narcotic action on the cortical brake leaves the drunkard dominated by his emotions. Alcohol the *word* seems to have the same effect on the cortical brain cells of the extreme wets and dries, who cease to be rational beings in discussing the subject, and are swayed solely by their emotions.

Irving Cobb in his series of *America Guyled Books* takes as the motto of Kansas "Am I my brother's keeper?" You bet your sweet life I am." And so every American whose emotions are stirred by the evil effects of alcohol, seems to believe him or herself divinely constituted, ipso facto, to be an expert on alcoholism. Carrie Nation has many sisters who only lack her daring.

They do things differently abroad. When England entered the World War she decided wisely to investigate all agencies which might interfere with the efficiency of the nation. She therefore ap-

pointed a scientific commission to study the subject of alcohol. That commission was made up of a pharmacologist (Cushney), a physiologist (Sherrington), a pathologist (Mott), a biological chemist (Dale), two alienists (Sullivan and McDougall) and a statistician (Greenwood), with Lord D'Abernon as chairman. The findings of this commission, practically applied, resulted in a marked increase in temperance in Great Britain.

Similarly in Denmark when the blockade during the war limited supplies, prohibition was tried for one month and abandoned. Dr. Hindhede then established a system of restriction which has practically eliminated delirium tremens as a problem in the hospitals of Copenhagen. Sweden actually voted for prohibition, but common sense prevented its being put into practice. Under the system of restriction instituted by Dr. Bratt, and bearing his name, Sweden has been converted from one of the most alcoholic nations in the world into a temperate people.

It is too much to hope that with our heterogeneous population we can equal in a few years the efficient results obtained in Great Britain and Scandinavia, with their homogeneous populations. It is my opinion, however, that until we approach the study of alcoholism from the standpoint of a public-health problem we shall fail in its solution. Sane legislation based upon scientific knowledge offers the greatest hope for successful control of chronic alcoholism, which is, in the last analysis, a disease.

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NEPHRITIC TOXEMIAS OF LATE PREGNANCY

A Clinical Study

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BOSTON

THE Carney Hospital, established seventy-five years ago, maintained a separate gynecological service during the first fifty-seven years of its existence. In 1919 an obstetrical service was established and combined with the gynecological. The combined service consists of twenty-eight gynecological and twenty-one obstetrical beds. By moving women who are out of bed and almost ready to go home to one of the small gynecological wards, we are able to care for twenty-five obstetrical patients when conditions so demand. This department has derived its clientele from three sources: the hospital's prenatal clinic, patients referred by physicians, largely those practicing near by the institution, and private patients. The largest group comes from the prenatal clinic.

From 1919 to 1936 inclusive there were 6909 deliveries. Of these there were 88 cases with nephritic toxemia of late pregnancy, an incidence of 1.28, or 1.3 per cent. All patients registering at the prenatal clinic are advised to report for examination every two weeks, and oftener if any complications arise. With such a small service only a limited number of patients can be treated, but the great advantage is that the service can be closely supervised. Our toxemias came from the three sources already mentioned, the more severe ones and those admitted in a moribund condition being referred to the hospital by physicians who usually had been called for the emergency and had not seen the patient before. Since the financial depression of 1929 many of the patients who formerly came to us have been referred to hospitals where no charge was made for ward beds, so that during the last seven years of our study the largest number of admissions came from our own prenatal clinic. During the seventeen years covered, there were only 6 cases of toxemia of the convulsive type or true eclampsia (4 antepartum cases and 2 postpartum), an incidence of 1/1151, or 0.1 per cent. (Stander's¹ collected cases give an incidence of 1/254, or 0.4 per cent.) A number of interns who have spent a year on the service have not seen a woman in convulsions. This has been due in large measure to prenatal care,

which has become well standardized in all clinics. The foregoing is in contrast to the experience of one of us (L. E. P.) who, while serving as indoor house surgeon at the New York Lying-In Hospital in 1914, saw patients with eclampsia admitted almost daily.

Eclampsia has been called the disease of theories. Despite the tremendous amount of research which has gone on and is still going on, the etiology remains obscure. The management of nephritic toxemias has undergone a marked change since the beginning of the present century. It was felt then by many accoucheurs that a woman suffering from severe toxemia and even having convulsions should be delivered at once. This belief was responsible for *accouchement forcé* with resulting deep lacerations of the cervix, sometimes rupture of the uterus, and septic phenomena frequently followed this forceful and brutal method of delivery. At this period a certain school of obstetricians favored immediate delivery by cesarean section—usually performed under full ether anesthesia—for the gravida admitted in convulsions and without labor, this anesthetic added a severe load on already badly damaged kidneys, and the operation superimposed marked shock on a very sick patient. During this same period of time chloroform, known to have extremely toxic effects on the liver, was given by inhalation to arrest the convulsions. The work of Stroganoff² and others in the medical or conservative treatment of eclampsia showed such improved results over the radical methods of immediate delivery by operative procedures that nowadays conservatism is resorted to in all well-conducted clinics, cesarean section playing but a small role in the management of this disorder.

The treatment, as applied now, is directed to the toxemia, and the pregnancy is disregarded for the time being, delivery being accomplished by one means or another only after the patient has improved from her toxic state or when the convulsions have subsided. Labor is usually induced by the simplest means at our command, namely the administration of castor oil, quinine in small doses and the rupture of the membranes. In the management of this malady cesarean section is reserved for primigravidas with long, rigid cervixes who fail to respond to medical treatment, in order to de-

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liver them before the onset of convulsions, and for those who have a definite indication for the operation on the basis of pelvic contraction and disproportion. Statistics have shown that the highest maternal mortality occurs during convulsions, the cause of death being ascribed in large measure to cerebral hemorrhage. Admittedly there are still a small number of women who develop toxemia and even eclampsia despite the best prenatal care we are able to give them. However, most of the severe cases we encounter occur in women who have had no prenatal care. Our own experience has been that it is sometimes extremely difficult to make patients who live almost next door to the clinic report for their bimonthly examinations.

We considered patients as toxemic when one or more of the following findings were present: elevated blood pressure, heavy trace of albumin, urinary casts, pitting edema of extremities or face, or both, associated with subjective symptoms of persistent headache, blurring of vision, dizziness or epigastralgia.

Seasonal Incidence The incidence of the cases according to season was as follows: spring, 23 per cent, summer, 25 per cent, autumn, 23 per cent, winter, 30 per cent. The largest number of cases occurred in October and December, each month having 15 per cent. The smallest incidence was in September, 2 per cent.

Age Tabulating the patients according to ages in five-year groups, we found 11 per cent from twenty-one to twenty-five years, inclusive, 30 per cent from twenty-six to thirty, 31 per cent from thirty-one to thirty-five, 25 per cent from thirty-six to forty, and 3 per cent from forty-one to forty-five. Combining these into ten-year groups gave an incidence of 41 per cent for the third decade, as compared with 56 per cent for the fourth decade, making a 15 per cent increase in incidence in the older group.

Parity Fifty per cent (44 patients) were primigravidas.

Duration of Pregnancy When Toxemia Was Noticed The percentage of the toxemic patients increased markedly as term was approached: from 11 per cent at twenty-two to twenty-six weeks to 20 per cent at twenty-seven to thirty-one weeks, and 68 per cent at thirty-two to thirty-six weeks.

Prenatal Care These cases were analyzed as to the type of prenatal care received, and divided into three groups, as follows: adequate care, inadequate care, no prenatal care. The patients who registered before the fifth month of pregnancy and who were regular in attendance were considered as having had adequate care. Those who registered

late in pregnancy or those who did not make regular prenatal visits were placed in the inadequate-care group. Those who had seen no physician, who were beyond the fifth month of pregnancy and who were toxemic or moribund when admitted were considered as having had no prenatal care.

Analysis of the cases showed that 36 per cent had adequate care, 55 per cent inadequate care and 9 per cent no care. Almost two thirds (64 per cent) of these toxemic patients had either inadequate or no prenatal care. This is a rather high percentage in this day and age, when we are constantly preaching about prenatal care to medical students, physicians and the laity. But we must take into consideration the fact that these cases go back to 1919, when prenatal care was not expounded to the laity so strenuously as it is today.

Onset of Labor Labor began spontaneously in less than one third (30 per cent) of the patients. It was induced medically (castor oil and quinine) in 1 per cent, and by the artificial rupture of the membranes either alone or with an additional procedure, such as the use of a Voorhees bag, bougie or gauze pack, in 42 per cent. The low transverse cervical cesarean section was employed in 20 per cent, Hirst cesarean in 1 per cent (1 case), and vaginal cesarean section in 6 per cent.

In no case was a cesarean section performed during the active stage of eclampsia or during convulsions.

In evaluating these statistics we must take into consideration the fact that many of these abdominal cesarean sections and all the vaginal ones were done at a period when the rapid emptying of the uterus as a means of treatment was still in vogue with some obstetricians.

Method of Delivery A little over one third (37 per cent) of the patients delivered spontaneously. The remaining women were delivered as follows: by forceps, 13 per cent, by internal podalic version, 14 per cent, by breech extraction, 6 per cent, by low transverse cervical cesarean section, 20 per cent, by Hirst cesarean, 1 per cent, by vaginal cesarean, 6 per cent, and by postmortem cesarean, 4 per cent.

Fifty per cent of the abdominal cesarean sections were performed under local anesthesia.

Infant Mortality A little more than one half (55 per cent) of the babies were born alive, 10 per cent died of prematurity within three days, 1 per cent (1 case) died of hemorrhagic disease of the newborn.

Slightly under one half of the stillborn were macerated fetuses. Included in the stillborn were 3 postmortem cesarean babies, at twenty-two, thirty-three and thirty-six weeks of pregnancy, respectively. The chance for a living baby in a toxemic

patient, as shown by this group of cases, is a little better than 1 2

Maternal Mortality Five deaths occurred, an uncorrected maternal mortality of 6 per cent. All these women had had inadequate prenatal care. 4 died undelivered, and 2 were admitted in moribund condition and died within twenty-four hours.

Case 1 A primigravida, aged 35, was 7½ months pregnant. She had a blood pressure of 250/120. The urine examination revealed 3+ albumin, with hyaline and granular casts and blood cells in the sediment. She had had four antepartum convulsions. Her prenatal care was inadequate. The diagnosis was eclampsia, acute nephritis and hypertension. She died undelivered and a postmortem cesarean section was performed. The fetus was stillborn.

Case 2 A primigravida, aged 40, was at term. She had had inadequate prenatal care. Her blood pressure was 200/120. Examination of the urine revealed 3+ albumin. The diagnosis was eclampsia. A first cesarean section was performed, a stillborn fetus being obtained.

Case 3 A quintgravida, aged 40, was 5 months pregnant, on admission she had a blood pressure of 266/104 and marked edema of the lower extremities. Examination of the urine revealed 2+ albumin, and hyaline and granular casts in the sediment. Her prenatal care was inadequate. In addition to toxemia of pregnancy she had hypertension, renal and pulmonary tuberculosis and aortic regurgitation. She died undelivered, and a macerated fetus was obtained when a postmortem cesarean section was performed.

Case 4 An octogravida, aged 38, was 6 months pregnant. She had a blood pressure on admission of 250/130. Examination of the urine revealed 3+ albumin, and hyaline and granular casts. Her prenatal care was inadequate. She had had a cerebral hemorrhage, and when admitted to the hospital was in a moribund condition and died within 24 hours.

Case 5 A primigravida, aged 36, was 8 months pregnant. She was admitted in a moribund condition. Her blood pressure was 182/120. Urine examination revealed 2+ albumin and hyaline casts. She had had inadequate prenatal care, and died within 24 hours. A postmortem cesarean section was performed, and a stillborn fetus was obtained.

Previous History of Toxemia Fifteen patients, or 17 per cent of our series, had had toxemia of pregnancy previously, 2 of them twice. When we remove from this group the primigravidas, who constituted 50 per cent of the entire number, and who ipso facto could not have had a previous toxemia, the percentage rises to 34.

In these multigravidas we were able to determine the condition of the kidneys in the intervening period between the previous toxemic condition and the present illness, and found that chronic nephritis was the underlying cause of these repeated toxemias. Chronic nephritis with hypertension accounted for 9 per cent of the entire group, or 18 per cent of the multigravidas, and chronic nephritis alone for 8 and 16 per cent, respectively.

Accidents of Labor There were 2 cases in which accidents of labor occurred.

Case 6 A primigravida, aged 24, was 6 months pregnant. She had had inadequate prenatal care. On admission examination revealed a premature separation of the placenta associated with hydramnios. Her blood pressure was 172/108. She had 3+ albumin in her urine. The membranes were ruptured artificially and she was delivered normally of a stillborn fetus. She had an uneventful recovery.

Case 7 A quintgravida, aged 39, was at term. She had had adequate prenatal care. On admission a diagnosis of marginal placenta previa was made. Her blood pressure was 185/100. Urine examination showed a trace of albumin. She was delivered by version and extraction. The baby died in 2 days and the mother made an uneventful recovery.

Treatment We did not adhere rigidly to any one regime. Our treatment consisted of a combination of sedation, elimination and diet. Sedation was obtained by the moderate use of morphine, bromides, chloral hydrate and the barbiturates.

For elimination, colonic irrigations and gastric lavage were used. In addition magnesium sulfate was given by mouth, or 20 cc of a 10 per cent solution intravenously, or 20 cc of a 25 per cent solution intramuscularly every hour for five doses, and repeated as necessary. We also used hypertonic glucose solution intravenously. A low-protein and low-salt diet was also utilized.

If the patient was in labor she was delivered as soon as possible, normally, by forceps or by version and extraction. Spontaneous delivery was preferred if she was having active labor and was progressing rapidly, but we did not allow a long second stage of labor, terminating such cases by forceps or version and extraction.

In multiparas, if the patient was not in labor it was induced by the artificial rupture of the membranes, either alone or in combination with the insertion of a Voorhees bag, a bougie or a gauze pack. The primigravidas who did not improve under the medical regime, and in whom we feared the onset of convulsions, the elderly women who had long rigid cervixes and the younger group who had some pelvic contraction or disproportion between the pelvis and the fetal head, were delivered by the low transverse cervical cesarean section, preferably under 1 per cent novocaine local anesthesia.

CONCLUSIONS

Careful supervision of pregnant women (prenatal care) has greatly improved results in nephritic toxemia of pregnancy.

An occasional patient develops eclampsia even

though she has had what is considered adequate prenatal care

Since the early part of this century the management of the toxemias of pregnancy has changed from radical to conservative

The treatment should be directed to the toxemia, and the pregnancy should be disregarded for the time being

Delivery through the pelvis by the simplest means possible has shown far better results than were obtained by radical abdominal delivery

Accouchement forcé is a relic of the past, and should have no place in the management of the toxemic patient

Cesarean section is but rarely indicated, and should be employed only in the delivery of a primigravida with a long rigid cervix who fails to improve under medical regime, in order to termi-

nate pregnancy before the onset of convulsions. The operation has to be considered in the presence of a contracted or malformed pelvis

Vaginal cesarean section, devised for the immediate delivery of a toxic patient, has been almost entirely discarded

In seventeen years at the Carney Hospital there were 6909 deliveries with 88 cases of late nephritic toxemia of pregnancy, an incidence of 1.78, or 1.3 per cent

Six women in the series had convulsions or eclampsia (4 antepartum and 2 postpartum), an incidence of 1.1151 or 0.1 per cent

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24201

PRESENTATION OF CASE

First admission A twenty-nine-year-old, white, American woman entered the hospital with the complaint of skin eruptions of two weeks' duration

About ten months before entry she began to have intermittent cough productive of moderate amounts of white sputum. She had lost about 10 lb. in weight during the two months previous to that time, and she noticed that she was gradually beginning to tire easily. About six months before entry she began to have pain in both knees and in her left hip. They felt hot and slightly tender and appeared to be swollen. Application of local heat gave complete relief after a few days. Six weeks before entry the joint pains returned with greater severity, and she also had soreness in the calves of both legs. The pain was not sufficiently severe to interfere with her work. Two weeks before entry small, reddish-purple, non-tender, maculopapular eruptions appeared on the exterior surfaces of her arms and thighs and spread to her face. Four days later ecchymotic areas about the size of a fifty-cent piece appeared on her arms and on the flexor surfaces of her legs, which gradually increased in size. One week before entry she had a temperature of 100°F, without chills, and for the two days before entry she had repeated nosebleeds. She had no hematemesis, hemoptysis, hematuria or melena, but her last menstrual flow three weeks before entry had been very profuse, with clots. During the two weeks before entry she lost about 5 lb. in weight and had had moderate malaise.

About a month after she was married, which was twelve years before entry, she had had attacks of severe dysuria and frequency which subsided after a period of treatment with douches. About one and a half years later while at a sanatorium for a "nervous breakdown" it was discovered that she had syphilis. For the year after that she had weekly arm and hip injections, and for the four months before entry she had again been given weekly hip injections. She stated that she had never been in very good health and that she had always had vague spells of difficulty in breathing.

She had no other cardiorespiratory symptoms or any history of previous blood dyscrasias or skin diseases. Her family history was essentially negative.

Physical examination revealed a well-developed and nourished woman in no apparent discomfort. There was slight pallor of the mucous membranes. On the face there were many papular urticaria like lesions with denuded surfaces, and a few similar lesions on the chest. On the left wrist and lower legs there were several ecchymotic areas, and there were petechiae on the lower legs, arms and buccal mucosa. There was a systolic apical heart murmur, and the blood pressure was 120 systolic, 86 diastolic. The abdominal and pelvic examinations were negative.

The temperature was 99°F, the pulse 85. The respirations were 20.

The urine had a specific gravity of 1.016 and was negative. The blood showed a red-cell count of 3,260,000 with 60 per cent hemoglobin, and a white-cell count of 4000 with 48 per cent polymorphonuclears, 43 per cent lymphocytes, 8 per cent monocytes and 1 per cent eosinophils. The platelets were greatly diminished. There were 12 per cent reticulocytes. The guaiac test on the stool was negative. The blood Hinton test was twice positive, and the blood Wassermann negative. The van den Bergh on the blood serum was normal, indirect. The bleeding time was 2 minutes, the clotting time 12 minutes. A lumbar puncture was entirely negative. The spinal-fluid Wassermann was negative.

An electrocardiogram showed a tendency to slight right-axis deviation, upright T₁, low T₂, inverted T₃ and T₄ and short Q₄. An x-ray of the chest showed no evidence of disease in the heart or lungs.

A tourniquet test done on the third day was positive. On the eleventh day the bleeding time from the ear was 15½ minutes and from the finger 16½ minutes. The clotting time was about 13 minutes and there was no clot retraction after sixteen hours. A sternal biopsy done on the fourteenth day showed hyperplasia of the marrow. There was increased cellularity, particularly evident in the granulocytic series. Megakaryocytes were also increased, the older forms being predominant. After the biopsy the patient vomited about an ounce of material which appeared to be changed blood. She had begun her menstrual period on the eighth hospital day and continued to flow quite profusely for two weeks. On the fifteenth day the red-cell count was 2,460,000 with 55 per cent hemoglobin. On that day her temperature rose to 101.5°F. Two days later she was given a transfusion of 550 cc of blood, and following that her temperature rose to

103°F It gradually fell to normal, but after another transfusion three days later, on the twenty-first day, she had chills and her temperature rose to 103.4°F Her red-cell count that day was 1,850,000 with 40 per cent hemoglobin, and the guaiac test on the stool was 4+ The stool was tarry in appearance In the next five days she was given three more transfusions totaling 1550 cc, at the end of which time her red-cell count was 1,970,000 with 45 per cent hemoglobin Her bleeding time on the twenty-fourth day was 20½ minutes, and a catheter urine specimen on the twenty-sixth day was grossly bloody The patient had refused to have a splenectomy but finally consented to the operation, which was done on the thirty-fourth day Preoperative and postoperative transfusions were given The bleeding time immediately after the operation was 9 minutes, and the following day it was 3½ minutes The clotting time was 4 minutes On the second postoperative day all bleeding from the gastrointestinal and genitourinary tracts had stopped Two days later the bleeding and clotting times were both 3 minutes, and there was slight clot retraction at the end of twenty hours The red-cell count was 2,450,000 with 46 per cent hemoglobin, and the white-cell count was 11,000 with 86 per cent polymorphonuclears, 10 per cent lymphocytes, 3 per cent monocytes and 1 per cent eosinophils The serum protein was 4 gm per cent On the eighth postoperative day the bleeding and clotting times were 3 and 4 minutes respectively, and clot retraction was complete in two hours She was discharged on the fifty-fifth day Her red-cell count at that time was 3,250,000 with 65 per cent hemoglobin, and the white-cell count was 8500 The platelets were still apparently reduced in number

Final admission (eleven weeks later) After discharge she went to a convalescent hospital, where she remained for two weeks She was very weak and still had a blotchy macular eruption on her face, arms and chest, which was crusted and itched a good deal She also had daily nosebleeds which were scant in amount, not nearly so profuse as before her first entry About six weeks before re-entry she again began to have joint pains which were much more severe than any she had had before and were her chief complaint at the time of re-entry One joint after another in her legs became swollen and painful and remained so for about a week when the process would gradually subside, only to recur later Her knees were most constantly affected She never noticed redness or discoloration of the joints The tendons of the middle two fingers of each hand periodically contracted so that she was unable to straighten the fingers and remained in that condition for several days The

skin lesions had gradually become more advanced, and the patient felt that during the month before re-entry she had lost a good deal of strength and weight After the splenectomy her menstrual periods had been regular but quite scanty, lasting only three days During her last period before re-entry she had noticed some small black and blue spots on her buttocks, these promptly disappeared During the entire period between entries she had taken daily doses of codeine and aspirin She had had no hematemesis, melena, hematuria, hemoptysis, nausea, vomiting, diarrhea or abdominal or chest pain She had had no pains in her muscles and no neurologic symptoms

Physical examination showed a fairly well-developed and nourished woman, who did not appear to be acutely ill There was a blotchy macular and papular skin eruption on the face, neck, anterior midchest and arms, with a shiny atrophic surface and some scaling and induration Many of the lesions had been excoriated There were similar lesions on the labia majora, and there were a few small petechiae on the inner aspects of the thighs There was slight generalized enlargement of the lymph nodes The heart, lungs and abdomen were negative, except for the splenectomy scar The uterus was enlarged to about the size of an orange and was freely movable The blood pressure was 115 systolic, 80 diastolic

The temperature was 99°F., the pulse 90 The respirations were 20

The urine had a specific gravity of 1.018, and contained a very slight trace of albumin The sediment contained many white cells and occasional hyaline and granular casts A urine concentration test gave a maximum specific gravity of 1.016 The blood showed a red-cell count of 3,600,000 with 65 per cent hemoglobin, and a white-cell count of 9500 with 78 per cent polymorphonuclears, 21 per cent lymphocytes and 1 per cent monocytes The guaiac test on the stool was negative The bleeding time was 1½ minutes, the clotting time 14½ minutes, and the tourniquet test negative The sedimentation rate was 1.99 mm per minute A blood culture gave no growth

An x-ray of the chest on the fifth day showed definite change from the last examination four months previously The transverse diameter of the heart was about 3 cm larger, and there was diffuse dilatation There was a little passive congestion in the lung fields X-ray photographs of the hands showed tufting of the terminal phalanges suggesting pulmonary osteoarthropathy X-rays of the sinuses were negative

A urine specimen on the ninth day contained a trace of albumin, and all subsequent urine speci-

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acterized by depressed function, particularly so far as platelets are concerned. The petechiae, hemorrhagic skin lesions, profuse menstruation, nosebleeds, hematemesis, hematuria, positive guaiac tests of the stools, positive tourniquet test, prolonged clotting time and lack of clot retraction are part of the syndrome of thrombocytopenic purpura—an organ manifestation of the disease. Thrombocytopenic purpura commonly occurs in lupus erythematosus, and it demonstrates the fact that this type of purpura is but a syndrome of a disease.

So far as involvement of the heart is concerned, there is generalized dilatation. This may have been caused by a pericarditis which is commonly present in the disease. There is no evidence of valvular deformity, nevertheless, nonbacterial verrucose endocarditis (Libman-Sachs syndrome) may well be present. These vegetations may be the result of sensitivity of valves to pressure along the line of closure. The probability of this is about 50 per cent. Whether the right ventricular preponderance is caused by pericarditis or by right-sided hypertrophy and dilatation due to involvement of the vascular and bronchial systems of the lungs cannot be stated with any degree of certainty.

The affection of the kidney is probably caused by arteritis, arteriolitis and vascular thrombotic lesions of the vessels of the glomeruli. I assume that, in spite of the coma, the patient did not die from uremia caused by the nephritis of visceral lupus erythematosus, but rather from a terminal pneumonic process.

I shall now comment on certain instructive features of the case. I am glad to note that the patient did not have a "butterfly distribution" of the skin lesions. This description is overemphasized, and we see it in but one group. The distribution and the sequence of involvement of various skin areas vary considerably. The moist surfaces, including the labia majora, may become involved, as in this case. At times the skin lesions may closely imitate those occurring in acute pellagra. In both diseases there is sensitivity of the skin to certain rays, to pressure and to inflammation in general.

Temperature reactions following transfusion, as in this case, are common in patients with severe blood dyscrasias. At times they precipitate pulmonary edema and coma.

I assume that splenectomy was undertaken because of the presence of thrombocytopenic purpura. This has been done in other cases in the past. It is usually, as in this case, of but temporary benefit. The platelets remained low after splenectomy, but nevertheless the bleeding stopped, indicating that the influence of splenectomy on bleeding does not depend entirely on changes in the number of the platelets.

DR. TRACY B. MALLORY: Dr. Holmes, would you care to commit yourself about the heart—whether it is hypertrophied or whether the apparent enlargement is due to pericarditis?

DR. GEORGE W. HOLMES: The general shape of the heart is that of a dilated heart. A considerable period of time has elapsed since she first began to show enlargement. It certainly is not the shape one would expect to see with hypertrophy of the ventricle. I do not believe we have sufficient evidence to distinguish between fluid and a dilated heart. My guess would be that there is more dilatation than fluid. These films were taken at close range and the heart probably is not nearly so large as it appears to be. One other point—I personally would not make a diagnosis of pulmonary heart disease from these films.

DR. JACOB LERMAN: I first saw this patient in the Out Patient Department, after the initial entrance, merely in a routine check-up. My attention was attracted by the fact that the rash, joint pains and facial swelling persisted. During this time she had taken considerable medication, such as codeine, aspirin and mandelic acid. Dr. Austin W. Cheever was called in to see her. We both agreed that the rash was not a drug eruption but probably of the same nature as the one present during her hospital stay. Consequently a diagnosis of lupus erythematosus was entertained and she was readmitted to the hospital with that diagnosis for further treatment and study.

I agree with Dr. Weiss that she developed the characteristic picture of lupus erythematosus. It was a surprise to hear him discuss the similarity between disseminated lupus erythematosus and pellagra. We have also entertained that idea and feel that a nutritional factor may be of importance in this disease. However, it is difficult to prove.

Another interesting point about lupus erythematosus is the following. Two years ago a patient with the characteristic picture of disseminated lupus erythematosus was found to have lymphoma, post mortem. More recently Dr. Myles P. Baker had a patient with the lesions similar to those of lupus erythematosus, but biopsy of a node showed multiple myeloma. It is possible that disseminated lupus erythematosus may be a manifestation of many diseases and not a disease entity.

DR. JACOB H. SWARTZ: I am not familiar with the case except from the discussion this morning. I am in accord with Dr. Weiss's complete discussion of the case, but I still wonder about drug eruptions. Drugs could give both the blood picture and the skin picture of lupus erythematosus with mucous membrane involvement.

DR. MALLORY: There was no history of taking drugs except what Dr. Lerman has mentioned.

mens likewise contained large amounts. An electrocardiogram on the ninth day showed definite but slight, right-axis deviation. A phenolsulfonphthalein test of kidney function on the eleventh day showed an excretion of 30 per cent in one hour with only 5 per cent excreted in the first fifteen minutes. On the following day the non-protein nitrogen of the blood was 31 mg per cent. Her temperature rose to 101.5°F on that day and until her death, eleven days later, ranged between 100 and 103.5°F. On the fourteenth day her face was somewhat puffy, and she complained of persisting headache. During the next three days the nonprotein nitrogen of the blood serum rose to 58 mg per cent. The blood chlorides were equivalent to 104 cc of N/10 sodium chloride. An x-ray picture of the chest on the sixteenth day showed further marked increase in the size of the heart on both sides. There was slight haziness over the left lower lung field. She became somewhat drowsy, and her heart had a gallop rhythm with many irregular beats. She finally lapsed into coma and died on the twenty-third day.

DIFFERENTIAL DIAGNOSIS

DR SOMA WEISS* In the diagnosis of a case with symptoms and signs related to many organs, three methods of approach are available. In the first place, one can undertake the differential interpretation of a single presenting symptom or sign, drawing in other findings thereafter through a similar analysis. The parallel direction of the interpretations of the clinical findings analyzed suggests the diagnosis. The second method is followed if the entire clinical picture can be translated at once into a single, well-understood physiologic or morphologic mechanism. Finally, there are cases in the diagnosis of which we still follow the time-honored nosologic correlation of clinical symptomatology with postmortem findings. This method is apt to be practiced in the diagnosis of diseases whose nature we do not understand.

In the interpretation of this case I shall follow the last method, first, because after reading the record of this patient a specific diagnosis forced itself upon me and, secondly, because the nature of the disease in question, if I am correct, is but poorly understood and vaguely defined.

A young woman develops fatigue, loss of weight, cough, attacks of tender, hot, swollen joints, sore muscles, fever, persistent skin lesions as described and a hemorrhagic tendency, which is at first slight and later more pronounced. The heart is normal except for a systolic murmur. In the late stage of the disease it becomes enlarged

and right-axis deviation develops. There is secondary anemia with reduced platelets. The bone marrow is hyperactive. Splenectomy is performed, which temporarily abolishes the hemorrhagic tendencies. For several months the patient remains weak, with remissions. Meanwhile, the skin lesions persist and advance. Gradually the hemorrhagic tendency and joint involvement return. Subsequently, generalized lymphadenopathy develops. Density of the basal portions of the lungs increases. Changes in the terminal phalanges of the fingers suggest osteoarthropathy. The sedimentation rate of the blood cells is increased. Blood culture is negative. Albumin appears in the urine and increases in amount. There is a tendency to fixation of the specific gravity of the urine. The nonprotein nitrogen becomes elevated, and the kidney functions impaired. The patient dies in coma after a progressive illness of over a year's duration.

The diagnosis is acute *disseminated lupus erythematosus*. At least, one can state with a considerable degree of clinical certainty that all the features in the case are entirely compatible with this disease. Indeed, it is difficult to find another disease which can explain more than part of the symptoms. Thus I believe, for reasons which because of lack of time I shall omit, that this patient did not suffer from rheumatic fever, subacute bacterial endocarditis, aplastic anemia, nonleukemic myelosis, lymphoma, Boeck's sarcoid or periarteritis nodosa. There may be further discussion about periarteritis nodosa later, but I do not believe that is the diagnosis in a clinical sense. I should prefer to discuss what is meant by the diagnosis of acute disseminated lupus erythematosus and what is the interpretation of the apparently bizarre features of the case in terms of morbid functions and structures.

The diagnosis of acute disseminated lupus erythematosus indicates a disease of unknown etiology with disseminated proliferative lesions of the minute blood vessels and lymphatics with a tendency to secondary thrombosis in these vessels. The disease is often associated with inflammation and proliferation of the surfaces of the serous cavities and the endocardium, and with thrombopenia.

In this particular case the lesions of the skin were rather widespread and characteristic, those of the bone marrow resulted in the clinical picture of thrombopenic purpura, those of the lymphatic system caused generalized lymphadenopathy, those of the heart resulted in dilatation, and those of the kidney produced a special form of vascular nephritis with glomerulitis, perhaps the disease also affected the lungs and certain serous surfaces.

Many of the outstanding features of the case are referable to disturbances of the bone marrow char-

*Associate professor of medicine Harvard Medical School assistant director Thorndike Memorial Laboratory Boston City Hospital

rule, and I back up this statement by the following facts. I am glad that Dr. Lerman has raised the question whether lupus erythematosus is anything but a reaction of the body to different agents. There is considerable evidence for that concept, nevertheless, as we see it clinically, lupus erythematosus is characterized by such widespread and specific involvement of internal organs and of the skin that it deserves the distinction of being called a syndrome or a disease. In this disease, vascular lesions are known to occur, and they can be one or another form of arteritis. A few cases of lupus erythematosus disseminatus with periarteritis-nodosa-like lesions have been reported in the literature. Therefore, the question arises whether it is more justifiable to correlate all the changes and make one diagnosis, or to pick out a few scattered vascular lesions and call that a disease. Certainly periarteritis nodosa is much less of a specific reaction than the syndrome of lupus erythematosus, because the more we see of periarteritis nodosa, the more we are impressed by the fact that it can occur as widespread lesions or as a local manifestation in one organ. It is found in rheumatic fever and frequently the patient recovers. I should like to know whether Dr. Mallory agrees with this reasoning.

DR. MALLORY: I believe that the question has to be left open. I think it is utterly impossible from a postmortem examination to rule out lupus erythematosus.

CASE 24202

PRESENTATION OF CASE

A thirteen-year-old, white, American schoolgirl entered the hospital with the complaint of cough and chest pain of nine weeks' duration.

Nine weeks before entry she began to have pleuritic pain in the right upper chest anteriorly, accompanied by a mild unproductive cough and beginning weakness. The symptoms continued for two weeks, and during that period she lost about 12 lb in weight. Her physician made a diagnosis of pneumonia and kept her in bed. At the end of the two weeks her chest pain disappeared entirely, but the cough, although lessened, continued practically unchanged. For the next month she was studied in an outside hospital. During that time she gradually regained some of her strength and weight. No treatment was given to her during that period. Three weeks before entry she returned home feeling reasonably well except for some persisting weakness and the continued cough. However, her physician would not allow her to return to school, and she was finally referred to this hospital for treatment. Her past history and family history were essentially negative.

She did not have frequent colds or sore throats, and she had not been exposed to tuberculosis.

Physical examination revealed a well-developed but somewhat undernourished girl in no apparent distress. The trachea was in the midline but moved to the right on deep inspiration. The right chest expanded less than the left, and breath sounds and resonance were diminished over its entire area. No definite dullness or rales could be heard. The heart was apparently shifted to the right but was otherwise negative. The blood pressure was 116 systolic, 70 diastolic. The abdomen was negative.

The temperature was 98.6°F., the pulse 90. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,830,000 with 89 per cent hemoglobin, and a white-cell count of 6400 with 50 per cent polymorphonuclears. The blood Hinton test was negative.

An x-ray of the chest showed displacement of the heart to the right and a definite expiratory shift to the left. There were bands of increased density in the right apical field. Within the right main bronchus there was a mass measuring 1.0 by 1.5 cm. which protruded far into the bronchus. Lipiodol studies were somewhat unsatisfactory because most of the lipiodol lodged below the mass. However, the mass seemed to be coated by it and appeared to arise from the right anterior aspect of the right main bronchus at the level of the carina with perhaps some protrusion into the trachea. Its lower margin lay close to the upper lobe bronchus.

On the eleventh day an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. CHARLES L. SHORT: This patient's history is essentially that of a pulmonary infection and does not give us much of a lead in diagnosis. Of course, such a history could be presented and often is by a patient who has a new growth in the lung. New growths, by obstructing the bronchi, frequently are the indirect cause of persistent infection in the distal portions of the lung. There is no mention of how much fever she had during her illness previous to admission. It says she had no sputum, which would be against a suppurative lesion of any extent, such as lung abscess, either with or without a foreign body, or bronchiectasis. She apparently had no hemoptysis. The physical examination is essentially that of partial obstruction to the right main bronchus. We find the right chest expanding less than the left. We have less air coming into the right lung and a shift of the heart to the right and some shift of the trachea to the right on inspiration. I think that is about

DR. JAMES H. MEANS It is interesting that she had syphilis. I suppose it had nothing to do with the present situation, but I should like to take note of it. At least she had positive Hinton and negative Wassermann tests, and is known to have had syphilis. I am also interested in what Dr. Lerman has said about this disease that we call lupus erythematosus to the effect that it may be a symptom of various diseases. I wonder if it ever might be a symptom of syphilis or of the combination of syphilis and toxic effect from anti-syphilitic treatment. I do not know why it should. I simply mention the possibility.

CLINICAL DIAGNOSES

Disseminated lupus erythematosus
Uremia
Terminal pericarditis
Latent syphilis

DR. WEISS'S DIAGNOSES

Acute disseminated lupus erythematosus with thrombocytopenic purpura, cardiac dilatation, vascular nephritis with arteritis and glomerulitis, mediastinopericarditis (?), nonbacterial verrucose endocarditis (?) and pulmonary involvement with vascular changes (?)
Terminal pneumonia

ANATOMICAL DIAGNOSES

(Acute disseminated lupus erythematosus)
Periarteritis nodosa
Bronchopneumonia
Hydrothorax
Hydropericardium
Purpura
Operation wounds: splenectomy, sternal biopsy, liver biopsy

PATHOLOGICAL DISCUSSION

DR. MALLORY From the pathologist's point of view lupus erythematosus is one of the most unsatisfactory diagnoses that he is ever called upon to confirm at autopsy. Dr. Weiss has mentioned a variety of vascular lesions which have been reported from time to time. Very few of them, however, are to be found in the average case. There is no visceral lesion as yet recognized which is constantly present in every case. A significant proportion show a lesion in the kidney which Baehr and Klemperer described and called a "wire loop lesion,"—a thickening of individual capillary walls in certain portions of each glomerular tuft,—but in my experience many fatal cases of lupus erythematosus do not show it. Indeed we have found it in less than half of ours, whereas Baehr

and Klemperer found it in considerably more than half of theirs. Also in the disease one finds lesions of larger blood vessels but they are not particularly common or at least in the course of looking through the average number of routine sections from an autopsy one is not apt to find such lesions. When one does find them they are somewhat variable in character, and I do not believe that anatomically they are specific. It is therefore impossible for the pathologist to say that Dr. Weiss's diagnosis is wrong, and yet I reached another diagnosis, which was periarteritis nodosa.

During the patient's life we had had opportunity to examine the spleen and also biopsies from the liver and the bone marrow. We could find no significant abnormalities.

Grossly, at autopsy, we found a normal-sized heart and a large pericardial effusion, which consisted of slightly turbid fluid. The kidneys showed slight abnormalities. The radial arteries seemed to be particularly prominent, and we found scattered petechial hemorrhages in the kidneys, throughout the gastrointestinal tract, and of course also in the skin, where they had been noted before autopsy. We were unable to make a diagnosis grossly and adopted the clinical diagnosis of lupus erythematosus which seemed to cover very satisfactorily all features of the case, but when the histologic preparations came through we found multiple arterial lesions in virtually every organ in the body. There were one or more involved vessels in every section of tissue which we made except in the lungs and in the skin. There I could find no arterial lesions. There was also a terminal pneumonia. The skin changes of edema, keratosis of the mouths of the coil glands, degeneration of the basal layer and slight lymphocytic infiltration are characteristic of lupus erythematosus. Since I am no dermatologist I should like to record that Dr. Hamilton Montgomery of the Mayo Clinic confirmed my impression of the skin slides. The lesions in the blood vessels were those of a periarteritis. There was necrosis of the media, intimal proliferation and sometimes thrombosis, and a small periarterial accumulation of cells, chiefly plasma cells, some monocytes, some erythrocytes, but very few eosinophils. So far as one individual lesion is concerned, I have seen something much like it in lupus erythematosus but I have never heard of lupus erythematosus with such extensive involvement of vessels.

DR. WEISS At times the question arises whether we should accept the pathologist's or the clinician's diagnosis. We usually accept the pathologist's diagnosis as the final verdict. Without presumption on my part, however, I venture to say that in this instance the clinical diagnosis should

nite diagnosis of fibrosarcoma by biopsy, the only possible treatment seemed to be extirpation, probably of the entire lung. The girl was anesthetized and the right pleural cavity opened. The right lung was found to be blown up as tightly as a drum, and no air could be pressed out of it. I was beginning to worry about what I was going to do in order to reach the hilum around this tightly blown-up lung when the patient had a profuse hemorrhage from within into her bronchial tree which flooded the other lung with blood. She died, presumably of a hemorrhage originating at the point of the endobronchial tumor. In retrospect or in facing another case with retention emphysema of the lung, I think that I certainly should make every effort to have the bronchus cleared by bronchoscopy before attempting pneumonectomy. However, the fatal hemorrhage might very well have followed bronchoscopic removal of the growth.

PREOPERATIVE DIAGNOSIS

Fibrosarcoma of right main bronchus (by bronchoscopic biopsy)

DR. SHORT'S DIAGNOSIS

Adenocarcinoma of the bronchus

ANATOMICAL DIAGNOSES

Fibrosarcoma of right main bronchus with ulceration

Chronic pneumonitis, slight

Fatal bronchial hemorrhage

Functional emphysema

PATHOLOGICAL DISCUSSION

DR. MALLORY: At postmortem examination we found the cause of the sudden hemoptysis or at least what seemed so to us. The major part of

the tumor, which was 5 mm. in diameter was lying perfectly free in the bronchus. It had evidently ulcerated off its base, and I think we have reason to believe that it had done so in the last few minutes before death because the cells in it were perfectly preserved. If the ulceration had occurred a few hours before, the tumor would probably have been expectorated, or if it had been retained in the bronchus, it would have begun to show signs of cytolysis or postmortem degeneration, which was not present. We found an erosion in the mucosa of the bronchus, which I think was without question the point at which the tumor had broken off, since in the bronchial wall beneath it there was persistent tumor. Our sections of the tumor are essentially the same as those of the bronchoscopic specimen removed at the other hospital. It was quite evident that it was a spindle-cell sarcoma growing at a moderate rate. It was definitely invasive at the base. There could be no question of its malignancy, and there was no possibility of cure except by pneumonectomy.

A PHYSICIAN: Were the glands involved?

DR. MALLORY: They were negative, as you would expect with sarcoma.

A PHYSICIAN: Were they enlarged?

DR. MALLORY: Yes, and throughout the right lung there was evidence of a certain amount of chronic infection. The lymphoid tissue in the parenchyma of the lung, for instance, showed definite hypertrophy, and the interlobular septa were edematous.

DR. CHURCHILL: About how far below the carina of the trachea was the point of attachment?

DR. MALLORY: It was just at the first bifurcation of the right bronchus.

DR. CHURCHILL: We could have reached it?

DR. MALLORY: Yes.

as far as we can go without the aid of the x-ray. We can simply say that the patient has a story which suggests an infectious pulmonary lesion but does not rule out a neoplastic process, and that on physical examination she has signs of partial obstruction of the right main bronchus.

X-RAY INTERPRETATION

DR AUBREY O HAMPTON These films were taken at intervals over a period of two months. The first ones were taken at another hospital before bronchoscopy and show collapse of the right upper lobe and partial collapse of the right middle and lower lobes. The interspaces are narrowed on the right. The diaphragm is elevated, and the heart is displaced to the right. Nine days later the picture has changed. There is a little more collapse of the right lung, and a film six days later shows a further change—the right lung shows more air than it did. Then after bronchoscopy at another hospital these final pictures were obtained at this hospital. This first film was taken at expiration and shows quite a normal-looking chest, in fact if only that view had been taken the chest would have passed as normal with the exception of a few lines at the right apex. But the precaution was taken of making a second film on inspiration, and it shows shift of the mediastinum on the right side. Finally, if you look at the lateral view you can faintly see a round white mass in the region of the bifurcation of the trachea.

DR SHORT Is that before lipiodol?

DR HAMPTON Yes.

DR SHORT That was not clear in the record.

DR HAMPTON It was more distinctly seen before lipiodol injection because of the quality of the film and the position in which it was taken. With the catheter in position at the time they injected lipiodol you can see that the catheter meets an obstruction in the right main bronchus. A smooth round mass extends from the carina downward.

DIFFERENTIAL DIAGNOSIS (continued)

DR SHORT The story of the bronchoscopy at the other hospital introduces an additional element which was not in the history, but I shall go ahead, without paying any attention to it, with the facts that are in the history here. The x-rays certainly bear out the clinical impression that she had obstruction to the right main bronchus and, furthermore, establish the fact that there was an actual mass in the bronchus. I think that this positive finding rules out any of the ordinary pulmonary infections, and we do not have to consider pneumonitis, lung abscess or bronchiectasis. To take up some other infections, I believe it is pos-

sible for syphilis to give a granulomatous type of mass in the bronchus, but I am sure it is very rare, and this patient had a negative Hinton test. I do not believe that sarcoid or yeast infection could give this picture. I think we do have to pause for a while on tuberculosis. She had no signs by x-ray of any parenchymatous involvement. She could conceivably have tracheobronchial tuberculosis with a granulomatous type of lesion in the main bronchus causing a partial bronchial obstruction. I believe, however, that she should show other signs of tuberculosis if that were the case, probably parenchymal tuberculosis, and have a positive sputum. So I think we can mention that in passing as an interesting possibility.

Could this mass represent a foreign body? There is no history of aspiration of a foreign body, no history of operation on the upper respiratory tract before the onset of symptoms, and if she had had a foreign body, she would probably have had more of a suppurative process. We are left with a consideration of this mass as representing a neoplasm in the bronchus. I do not know how we can say what type of neoplasm it is without more definite information. Perhaps this was discovered at the other hospital by biopsy at the time of bronchoscopy. She has had no bleeding, which would be somewhat against her having a benign polyp. Of course, the child's age is against a malignant growth of the bronchus, but I believe such cases have been reported in children and in young adults. We have no evidence as to whether she had a benign growth, such as a fibroma or lipoma, or the so-called benign adenoma. The most common new growth in this situation would be an adenocarcinoma of the bronchus. The history, as I mentioned before, is not against this diagnosis. She may have had the tumor a long while before she had symptoms, as we sometimes see metastases in the brain in patients with carcinoma of the bronchus before any suspicion has been directed toward the lung. If this is the diagnosis, there are no signs or evidence of metastases. Simply because this is the most common new growth in such a situation, I will say it is an adenocarcinoma of the bronchus.

DR TRACY B MALLORY The case was presented to us in slightly different form, the patient was sent to us with the diagnosis already made by bronchoscopy. The diagnosis was fibrosarcoma, which seemed very astonishing as we had never seen or heard of primary fibrosarcoma of the bronchus, but an excellent slide which was sent to us enabled us to confirm the diagnosis.

DR CHURCHILL, would you like to make a comment?

DR EDWARD D CHURCHILL Having the defi-

nite diagnosis of fibrosarcoma by biopsy, the only possible treatment seemed to be extirpation, probably of the entire lung. The girl was anesthetized and the right pleural cavity opened. The right lung was found to be blown up as tightly as a drum, and no air could be pressed out of it. I was beginning to worry about what I was going to do in order to reach the hilum around this tightly blown up lung when the patient had a profuse hemorrhage from within into her bronchial tree which flooded the other lung with blood. She died, presumably of a hemorrhage originating at the point of the endobronchial tumor. In retrospect or in facing another case with retention emphysema of the lung, I think that I certainly should make every effort to have the bronchus cleared by bronchoscopy before attempting pneumonectomy. However, the fatal hemorrhage might very well have followed bronchoscopic removal of the growth.

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COMMUNICATIONS should be addressed to the NEW ENGLAND JOURNAL OF MEDICINE, 8 Fenway, Boston, Mass.

WHEELER-LEA ACT

THE Wheeler-Lea Act to control false and fraudulent advertising of foods, drugs and cosmetics was recently passed by Congress and signed by the President. This bill is complex and difficult to understand. It would seem to control satisfactorily, with proper penalties, this extremely important matter of false and fraudulent advertising, but there is considerable doubt as to whether the purpose of the bill will be accomplished. In the first place it brings in a divided responsibility inasmuch as the enforcement of the provisions of this bill is placed in the hands of the Federal Trade Commission, while the other control of drugs, foods and cosmetics presumably will remain in the hands of the Food and Drug Administration of the Department of Agriculture, where it was placed in 1906 under the original

Food and Drug Act. In the second place it seems that the procedures to be followed under this proposed bill by the Federal Trade Commission lend themselves particularly well to delay and evasion. In the third place past experience suggests that the Federal Trade Commission will not enforce the necessary procedures effectively.

Why was such a bill written and approved? The proper answer seems to be that powerful business interests of the trade in drugs and cosmetics saw in this method an escape from the more effective provisions contained in a bill (Senate 5) passed in the Senate, which placed all phases of control under the Food and Drug Administration. Perhaps the trade thought it wiser not to antagonize the medical and lay public by an open attack on the latter bill and to seem to favor control without actually allowing control. If so, they could hardly have taken a better way. The medical profession has used its influence for an adequate control; it seems that it has lost out. Even the provisions of the old Food and Drug Act were better than those of the new, unless the Federal Trade Commission awakens to the fact that the trade has pulled its leg and vigorously enforces these regulations against false and fraudulent advertising by minimizing the possible delays and by imposing maximal penalties. We await with curiosity to see how this new act will be made to work.

THE COMMONWEALTH FUND

THE Commonwealth Fund of New York has recently released its nineteenth annual report. Originally endowed by Mrs. Stephen V. Harkness in 1918, the fund has, during the past year, been the recipient of two gifts from its president, Edward S. Harkness, totaling \$8,000,000 and bringing the total endowment of the fund to over \$50,000,000. Of Mr. Harkness's recent gifts it is planned for the present to devote the income from \$3,000,000 to the development of rural hospitals, and that from \$5,000,000 to medical education and research.

Grants of approximately \$1,800,000 were made from current income in the year ending Septem-

ber 30, 1937, going toward a variety of useful purposes. The fund has already been responsible for the building of ten community hospitals in rural communities, eight of which are already in operation. These well-equipped hospitals of approximately fifty beds are located in Maine, Ohio, Virginia, Kentucky, Mississippi, Oklahoma, Kansas and Utah, with two in Tennessee.

The value of these hospitals to their communities can hardly be estimated, but they are also serving another purpose in which the fund is keenly interested—the attracting to small communities of well-trained young physicians. Fifty young physicians have already settled in the vicinity of the first six of these institutions, and as a further step in this direction a number of scholarships have been provided at Vanderbilt University, Tulane University and Tufts College medical schools. In addition more than 400 fellowships have been made available to older men in practice who wish to brush up on current medical information.

In the department of medical education, funds have been provided to strengthen the teaching of preventive medicine at Vanderbilt, Tulane and Tufts, at Tulane the expansion of the Department of Pediatrics has been aided, at Cornell, Columbia and Harvard the fund has helped to finance teaching clinics for emotional and behavior problems. The teaching and the study of psychiatry have been assisted at the University of Louisville, Johns Hopkins and the University of Colorado.

The fund has aided medical research in general in a number of medical schools and hospitals, selecting problems that give promise of contributing sooner or later to better medical practice. Thus, during the past year, seven new undertakings have been selected for subsidy in addition to those carried forward from previous years. Public health

has been aided in Tennessee and Mississippi by the provision of traveling units to advise local health units, and in Massachusetts by a tuberculosis eradication campaign in a Berkshire County district.

These activities do not close the list of the fund's philanthropies. A child-guidance clinic is still being supported in London, problems in legal research are being studied, and a number of Brush fellowships are supported.

The time may be at hand when it will be necessary for public funds to underwrite medical education and scientific research, but if the independence, initiative and integrity of private philanthropy that are exemplified by the activities of the Commonwealth Fund disappear, medicine will be the loser.

MASSACHUSETTS MEDICAL SOCIETY

ANNUAL MEETING OF THE COUNCIL

The annual meeting of the Council will be held in the Penthouse of the Hotel Bradford, Boston, on Wednesday, June 1, at 10.30 a m.

Business

- 1 Reading record of last meeting in abstract
- 2 Nominating Committee retires to deliberate
- 3 Report of Committee on Membership and Finance
- 4 Reports of committees to consider petitions for restoration to the privileges of fellowship and new committees to be appointed
- 5 Reports of standing committees and special committees
- 6 Election of officers and orator by ballot
- 7 Appointment of committees for ensuing year, both standing and special
- 8 Proposed changes in by-laws
- 9 Incidental business

ALEXANDER S BEGG, *Secretary*

Councilors are asked to sign one of the two attendance books before the meeting. The Cotting Luncheon will be served immediately after the meeting.

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WHEELER-LEA ACT

THE Wheeler-Lea Act to control false and fraudulent advertising of foods, drugs and cosmetics was recently passed by Congress and signed by the President. This bill is complex and difficult to understand. It would seem to control satisfactorily, with proper penalties, this extremely important matter of false and fraudulent advertising, but there is considerable doubt as to whether the purpose of the bill will be accomplished. In the first place it brings in a divided responsibility inasmuch as the enforcement of the provisions of this bill is placed in the hands of the Federal Trade Commission, while the other control of drugs, foods and cosmetics presumably will remain in the hands of the Food and Drug Administration of the Department of Agriculture, where it was placed in 1906 under the original

Food and Drug Act. In the second place it seems that the procedures to be followed under this proposed bill by the Federal Trade Commission lend themselves particularly well to delay and evasion. In the third place past experience suggests that the Federal Trade Commission will not enforce the necessary procedures effectively.

Why was such a bill written and approved? The proper answer seems to be that powerful business interests of the trade in drugs and cosmetics saw in this method an escape from the more effective provisions contained in a bill (Senate 5) passed in the Senate, which placed all phases of control under the Food and Drug Administration. Perhaps the trade thought it wiser not to antagonize the medical and lay public by an open attack on the latter bill and to seem to favor control without actually allowing control. If so, they could hardly have taken a better way. The medical profession has used its influence for an adequate control, it seems that it has lost out. Even the provisions of the old Food and Drug Act were better than those of the new, unless the Federal Trade Commission awakens to the fact that the trade has pulled its leg and vigorously enforces these regulations against false and fraudulent advertising by minimizing the possible delays and by imposing maximal penalties. We await with curiosity to see how this new act will be made to work.

THE COMMONWEALTH FUND

THE Commonwealth Fund of New York has recently released its nineteenth annual report. Originally endowed by Mrs. Stephen V. Harkness in 1918, the fund has, during the past year, been the recipient of two gifts from its president, Edward S. Harkness, totaling \$8,000,000 and bringing the total endowment of the fund to over \$50,000,000. Of Mr. Harkness's recent gifts it is planned for the present to devote the income from \$3,000,000 to the development of rural hospitals, and that from \$5,000,000 to medical education and research.

Grants of approximately \$1,800,000 were made from current income in the year ending Septem-

THE ONE HUNDRED AND FIFTY-SEVENTH ANNIVERSARY

Tuesday, Wednesday and Thursday, May 31 and June 1 and 2
Hotel Bradford, Boston

STANDING COMMITTEES

Of Arrangements

W S Burrage, R. P. Stetson, Augustus Thorndike, Jr., E. J. O'Brien, Jr., W. T. O'Halloran

On Publications

R. I. Lee, R. M. Smith, F. H. Lahey, J. P. O'Hare, Conrad Wesselhoeft.

On Membership and Finance

D. N. Blakely, G. C. Caner, J. E. Fish, H. F. Newton, H. Q. Gallupe.

On Ethics and Discipline

David Cheever, R. L. DeNormandie, C. J. Hickham, R. R. Stratton, W. J. Bricklev

On Permanent Home

W. H. Robey, C. G. Mixer, J. M. Birnle, C. S. Butler, E. C. Miller

On Medical Education and Medical Diplomas

Reginald Fitz, C. A. Sparrow, E. S. Calderwood, A. W. Stearns, F. S. Kellogg

On State and National Legislation

C. C. Lund, A. W. Marsh, B. F. Conley, D. L. Lionberger, A. M. Butler (*ad interim*)

On Public Health

R. B. Osgood, Gerald Hoeffel, G. D. Henderson, S. C. Dalrymple, H. L. Lombard

On Medical Defense

F. G. Balch, E. D. Gardner, F. B. Sweet, A. W. Allen, W. R. Morrison.

— ASSIGNMENTS OF COMMITTEEMEN AND AIDS

TUESDAY — MAY 31

MORNING

Section of Surgery—Dr. Augustus Thorndike, Jr., in charge.

Aids—Dr. J. A. Halsted, Dr. Harrison Kennard

Section of Pediatrics—Dr. R. P. Stetson, in charge.

Aids—Dr. J. R. Graham, Dr. G. P. Sturgis

AFTERNOON

Section of Dermatology and Syphilology—Dr. W. T. O'Halloran, in charge

Aids—Dr. F. M. O'Connor, Dr. William Egan

Section of Obstetrics and Gynecology—Dr. E. J. O'Brien, Jr., in charge.

Aids—Dr. T. E. Caulfield Jr., Dr. J. A. Hennessy

EVENING

Shattuck Lecture—Dr. W. S. Burrage, in charge

Aids—Dr. G. D. Krumbhaar, Dr. Lendon Snedeker

— WEDNESDAY — JUNE 1

MORNING

Council Meeting—Dr. E. J. O'Brien, Jr., in charge.

Combined Clinical Meeting—Dr. Augustus Thorndike, Jr., *Chairman*

Dr. W. T. O'Halloran, in charge of morning session

Aids—Dr. F. M. O'Connor, Dr. William Egan, Dr. G. D. Krumbhaar, Dr. Lendon Snedeker

Dr. R. P. Stetson, in charge of afternoon session

Aids—Dr. J. R. Graham, Dr. G. P. Sturgis, Dr. J. A. Halsted, Dr. Harrison Kennard.

AFTERNOON

Golf Tournament—Dr. W. T. O'Halloran, in charge.

EVENING

Annual Dinner—Dr. R. P. Stetson, in charge.

Aids—Dr. J. R. Graham, Dr. G. P. Sturgis

THURSDAY — JUNE 2

MORNING

Section of Medicine—Dr. W. T. O'Halloran, in charge.

Aids—Dr. F. M. O'Connor, Dr. William Egan

Section of Radiology and Physiotherapy—Dr. R. P. Stetson, in charge.

Aids—Dr. J. R. Graham, Dr. G. P. Sturgis

NOON

Annual Meeting and Oration—Dr. W. S. Burrage, in charge

Aids—Dr. G. D. Krumbhaar, Dr. Lendon Snedeker

— GENERAL INFORMATION —

All meetings, commercial and scientific exhibits, clinical meetings, luncheons and dinner will be held in the Hotel Bradford.

A *Bureau of Information* will be maintained at the Registration Desk on the stage of the Ballroom. Physicians expecting to receive telephone calls should leave proper information with the hotel operator.

Fellows are requested to register as soon as they arrive and to get tickets for the Annual Dinner and for the Thursday Luncheon. The charge for the Annual Dinner will be \$1.00 to those who are not in arrears and the Thursday Luncheon will be without charge to those whose dues have been paid.

The *scientific exhibits* are located in the balcony of the Ballroom.

The *commercial exhibits* are all located in the Ballroom.

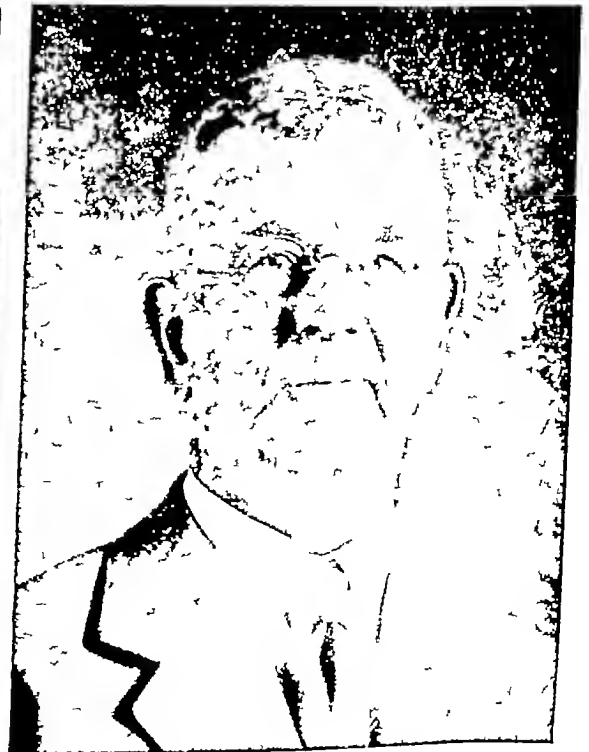
The *Physicians Art Society* will hold an exhibition throughout the meeting in both the Men's and Women's Lounge.

Free parking for members' cars has been provided in the parking lot on Hollis Street, directly opposite the hotel.

Golf Tournament There will be a golf tournament for members on Wednesday afternoon, June 1, at the Commonwealth Country Club, 91 Algonquin Road, Newton Centre. Information and instruction sheets may be procured at the Registration Desk.

MASSACHUSETTS MEDICAL SOCIETY

OFFICERS 1937-1938

DR CHANNING FROTHINGHAM, *President*DR WALTER G PHIPPEN, *Vice President*DR. ALEXANDER S BEGG, *Secretary*DR CHARLES S BUTLER, *Treasurer*

CARNEY HOSPITAL STAFF

9 30-9 45 a. m.

- 3 *Median Nerve Lesions of the Hand Surgical treatment and results* Dr William E. Browne, Boston.

PETER BENT BRIGHAM HOSPITAL STAFF

9 45-10 00 a. m.

- 4 *Innocent Gallstones and Harmful Cholecystectomy?*
Dr David Cheever, Boston

10 00-10 15 a. m.

- 5 *The Oral Cavity as an Aid to the Diagnosis of Metabolic Disorders* Dr M S Strock, Boston.

10 15-10 30 a. m.

- 6 *Factors in the Course of Heart Disease* Dr C. Sidney Burwell, Boston.

10 30-10 45 a. m.

- 7 *Atypical Rheumatic Fever* Dr Samuel A Levine Boston.

BETH ISRAEL HOSPITAL STAFF

10 45-11 00 a. m.

- 8 *The Treatment of Dangerous Reactions to Novocaine*
Dr Samuel Gilman, Boston.

11 00-11 15 a. m.

- 9 *The Value of Palliative Surgical Therapy of Advanced Carcinoma of the Gastrointestinal Tract* Dr Charles G Mixer, Boston.

BOSTON CITY HOSPITAL STAFF

11 15-11 30 a. m.

- 10 *The Diagnosis and Treatment of True Toxemia of Pregnancy* Dr Maurice B Strauss, Boston

11 30-11 45 a. m.

- 11 *The Heart in Anemia* Dr James M. Faulkner, Boston

11 45-12 00 m.

- 12 *The Protean Character of the Leukemoid States* Dr Henry Jackson, Jr, Boston.

12 00 m. 12 15 p. m.

- 13 *Plasma Fibrinogen and the Sedimentation Rate* Dr Thomas H. Ham, Boston.

HUNTINGTON MEMORIAL HOSPITAL STAFF

12 15-12 45 p. m.

- 14 *The Value of Million-Volt Roentgen Rays in Cancer Therapy* Dr Richard Dresser, Boston

SUPERVISING CENSORS ANNUAL MEETING

10 00 a. m.

Parlor 646, Sixth Floor

ANNUAL MEETING OF COUNCIL

10 30 a. m.

Penthouse, Fourteenth Floor

This meeting will be followed by the Cotting Luncheon to councilors. Should the Council meeting be prolonged, the councilors will reconvene for an adjourned meeting

Notices of the meeting, with the order of business, will be mailed to councilors on May 24

COMBINED CLINICAL MEETING (continued)

NEW ENGLAND DEACONESS HOSPITAL STAFF

2 00-2 15 p. m.

- 15 *Diabetic Coma* Dr Alexander Marble, Boston.

2 15-2 30 p. m.

- 16 *A Consideration of Some of the Surgical Aspects of Cancer* Dr Frank H. Lahey, Boston.

CHILDREN'S HOSPITAL STAFF

2 30-2 45 p. m.

- 17 *Serum Therapy in Pneumonia in Infants and Children* Dr Benjamin W Carey, Jr, Boston

2 45-3 00 p. m.

- 18 *The Treatment of Club Feet in Infancy* Dr William T Green, Boston.

3 00-3 15 p. m.

- 19 *The Surgical Significance of Urinary Incontinence in Infancy and Childhood* Dr Thomas H. Lanman, Boston

MASSACHUSETTS GENERAL HOSPITAL STAFF

3 15-3 30 p. m.

- 20 *Peptic Ulcer from a Surgical Point of View* Dr Arthur W Allen and Dr Claude E. Welch, Boston

3 30-3 45 p. m.

- 21 *The Treatment of the Sick Liver* Dr Chester M Jones, Boston.

3 45-4 00 p. m.

- 22 *Gout* Dr John H. Talbott, Boston.

4 00-4 15 p. m.

- 23 *The Surgical Treatment of Bronchiectasis* Dr Edward D Churchill, Boston

FAULKNER HOSPITAL STAFF

4 15-4 30 p. m.

- 24 *The Practical Relation of Organotherapy to Medical Practice* Dr William R. Ohler, Boston.

MASSACHUSETTS MEMORIAL HOSPITALS STAFF

4 30-4 45 p. m.

- 25 *Osteomyelitis of the Frontal Bone* Dr Leighton F Johnson, Boston

TUESDAY—MAY 31

SECTION OF SURGERY

10 00 o'clock

Penthouse, Fourteenth Floor

Dr Leland S McKittrick, Boston, *Chairman*
 Dr John M. Fallon, Worcester, *Secretary*

- 1 *Immediate or Deferred Surgery for General Peritonitis Associated with Appendicitis* a *In Adults* Dr Irving J Walker, Boston. b *In Children* Dr William E Ladd, Boston.

- 2 *Treatment of Peritonitis Complicating Appendicitis* Dr Arthur M. Shipley, professor of surgery, University of Maryland School of Medicine, Baltimore. (By invitation)

Discussion by Dr John M Birnie, Springfield, and Dr James C McCann, Worcester

- 3 *Acute Bowel Obstruction Its recognition and management* Dr Owen H Wangenstein, professor of surgery, University of Minnesota Medical School, Minneapolis (By invitation)

Discussion by Dr Howard M. Clute, Boston

- 4 *Rectal Intravenous and Prolonged Spinal Anesthesia* Dr Lincoln F Sise, Boston

Discussion by Dr Sidney C Wiggan, Boston

SECTION OF PEDIATRICS

10 00 o'clock

Oval Room, Mezzanine Floor

Dr Paul W Emerson, Boston, *Chairman*
 Dr James M Baty, Belmont and Boston, *Secretary*

PANEL DISCUSSION

Cyanosis of the Newborn

Leader, Dr Charles F McKhann, Children's Hospital, Boston

Intracranial Dr Stewart H. Clifford, Boston Lying in Hospital

Circulatory Dr Hyman Green, Beth Israel Hospital, Boston

Pulmonary, Dr James M. Baty, Boston Floating Hospital

Pathological Dr Sidney Farber, Children's Hospital, Boston.

Obstetrical Dr Harold M Teel, Boston Lying in Hospital

SECTION OF OBSTETRICS AND GYNECOLOGY

2 00 o'clock

Studio C, Fifth Floor

Dr Raymond S Titus, Boston, *Chairman*
 Dr Roy J Heffernan, Boston, *Vice-Chairman*
 Dr M Fletcher Eades, Boston, *Secretary*

- 1 *Resume of Maternal Mortality Study in the State of Massachusetts for the Year 1937* Dr Roy J Heffernan, Boston

- 2 *Cesarean Section in the State of Massachusetts in the Year 1937* Dr Robert L. DeNormandie, Boston

- 3 *Preliminary Report of the Small Obstetrical Hospitals in the State of Massachusetts* Dr Joseph C Merriam, Framingham.

Discussion to be opened by Dr Samuel A. Cosgrove, attending obstetrician, Jersey City Medical Center and Christ hospitals, Jersey City, New Jersey (By invitation)

SECTION OF DERMATOLOGY AND SYPHILOLOGY

2 00 o'clock

Oval Room, Mezzanine Floor

Dr George A Dix, Worcester *Chairman*
 Dr J Harper Blaisdell, Boston, *Secretary*

- 1 *The Relation of Dermatology to General Medicine* Dr George A Dix, Worcester

- 2 *Lupus Erythematosus Present status in regard to etiology and treatment* Dr Maurice M Tolman, Boston.

Discussion by Dr E Lawrence Oliver, Boston.

- 3 *Are Patch Tests of Real Value in Dermatology?* Dr John G Downing, Boston.

Discussion by Dr Mildred L Ryan, Brockton, and Dr Bernard Appel, Boston.

- 4 *Atopic Dermatitis* Dr Joseph Goodman, Boston
 Discussion by Dr C Guy Lane, Boston, and Dr Francis M Thurmon, Boston

- 5 *Syphilitic Scars of the Spirit* Dr Austin W Cheever, Boston.

Discussion by Dr Ray L. Whitney, Boston

8 00 o'clock

Lobby Salon, First Floor

ADDRESS

Work and Aims of the Public Health Service Dr Thomas Parran, Surgeon General, United States Public Health Service, Washington, D C

THE SHATTUCK LECTURE

America's Contribution to Nosography Dr David Riesman, emeritus professor of clinical medicine and professor of the history of medicine at the University of Pennsylvania School of Medicine, Philadelphia

Light refreshments will be served after the lecture.

* * *

WEDNESDAY—JUNE 1

COMBINED CLINICAL MEETING

9 00 a. m.—1 00 p. m. 2 00 p. m.—5 00 p. m.
 Lobby Salon, First Floor

BOSTON LYING-IN HOSPITAL STAFF

9 00-9 15 a. m.

- 1 *Placenta Previa* Dr M Fletcher Eades, Boston.

9 15-9 30 a. m.

- 2 *Premature Separation of the Normally Implanted Placenta* Dr Charles P Sheldon, Boston.

NEW ENGLAND MEDICAL CENTER STAFF

4 45 5 00 p m.

- 26 *Some Observations on Salt and Water Exchange as Related to the Management of Heart Failure* Dr Samuel H. Proger, Boston.

ANNUAL DINNER

7 15 p m

Lobby Salon, First Floor

Fellows wishing to sit together at the dinner please send their names to the Committee of Arrangements, 8 Fenway, Boston, at the earliest possible moment.

Tickets for the dinner (price \$1 00) should be obtained at the Registration Desk

* * *

THURSDAY—JUNE 2

SECTION OF MEDICINE

9 30 a m

Penthouse, Fourteenth Floor

Dr William H Robey, Boston, *Chairman*
Dr Clark W Heath, Boston, *Secretary*

- 1 *The Diabetic Situation in Massachusetts* Dr Elliott P Joslin, Boston

Discussion by Dr Bernard Rabinovitz, Springfield,
and Dr William Mason, Fall River

- 2 *Attitudes in Relation to Illness* Dr Lawrence K Lunt, Boston.

Discussion by Dr Arlie V Bock, Cambridge, and
Dr G Colket Caner, Boston.

- 3 *Sulfanilamide a Its Value and Mode of Action in the Treatment of Various Infections* Dr Chester Keefer, Boston.

b The Treatment of Pneumococcic Meningitis Dr Maxwell Finland.

Discussion by Dr Conrad Wesselhoeft, Boston, and
Dr Edwin H Place, Boston

- 4 *The Significance of Latent Forms of Tuberculosis* Dr J Burns Amberson, Jr, visiting physician, Tuberculosis Service, Bellevue Hospital, New York City (By invitation)

Discussion by Dr Henry D Chadwick, Boston, and
Dr Donald S King, Boston

SECTION OF RADIOLOGY AND PHYSIOTHERAPY

9 30 a m.

Oval Room, Mezzanine Floor

Dr Frank E Wheatley, Milton, *Chairman*
Dr Herman A Osgood, Boston, *Secretary*

- 1 *X Ray Treatment of Cancer in the Smaller Communities* Dr Frederick W O'Brien, Boston.

- 2 *Physical Measures of Value to the General Practitioner*

- 3 *The Roentgen Ray Therapy of Inflammation*
Dr Frederick O Coe, professor,
Georgetown University Medical
School, D C (By invitation.)

ANNUAL MEETING

12 00 m.

Lobby Salon, First Floor

Business of the Annual Meeting

Address by the President.

Annual Oration *The Passing of Surgery*
Allen G Ruce, Springfield.

At the close of the Annual Oration,
served to those who have obtained tickets

LADIES COMMITTEE

Mrs Channing Frothingham, C

Mrs Walter S Burrage, Mrs August
Mrs Edward J O'Brien, Jr, Mrs William
Mrs W Jason Mixter, Mrs Frederick
Herrman L. Blumgart, Mrs Harold C
Kenneth Mallory, Mrs Francis D Ingraham

LADIES CALENDAR

TUESDAY—MAY 31

Registration, Hotel Bradford

Dinner and entertainment at Gundlach's
hope Street, Boston, at 6 30 p m.,
Massachusetts Medical Society, to meet
ham and the wives of the district
charge.

Shattuck Lecture—8 00 p m., Hotel
by Dr David Riesman, emeritus professor
medicine and professor of the University
of Pennsylvania School of Medicine,
Philadelphia, and an address by Surgeon
Parran, U S Public Health Service,

WEDNESDAY—JUNE 1

Registration

Visit to the Peter Bent Brigham and
Hospitals from 10 00 a. m. to 12 00 m.

Tea—the Isabella Stewart Gardner
Museum. There will be a tour of the
Museum from 3 00 to 4 00 p m., followed by a
refreshment served at 4 30 p m. Buses leave
at 2 45 p m. No charge.

Ladies are invited to hear the speakers
dinner of the Massachusetts Medical
Society at Hotel Bradford at 8 15 p m.

THURSDAY—JUNE 2

Registration

SCIENTIFIC EXHIBITS

	Booth No
<i>Pneumonia</i> The Massachusetts Department of Public Health	59, 60, 61
<i>Advances in the Treatment of Diabetes</i> Dr Elliott P Joslin and associates	62, 63, 64
<i>Pathogenic Fungi</i> Dr Jacob H Swartz	65
<i>Plastic Surgery Exhibit Showing the Repair of Facial Deformities of Various Kinds</i> Dr Varaztad H Kazanjian	66 67
<i>Recent Studies of Essential Hypertension</i> Drs Robert S Palmer, Reginald H. Smithwick, Neil L. Crone and Richard Chute	68
<i>Gross Placental Pathology</i> From the departments of obstetrics and pathology of the Harvard Medical School and the Pathological Laboratory of the Boston Lying in Hospital Dr Frederick C Irving	69
<i>Gynecological Exhibit</i> From the Free Hospital for Women, Brookline. Dr John Rock	70
<i>Gastric Surgery</i> Dr William R. Morrison	71
<i>Medical and Surgical Aspects of Jaundice</i> From the Peter Bent Brigham Hospital Drs Robert M. Zollinger and E. Stanley Emery, Jr	72
<i>Cancer of the Rectum</i> Drs. Richard Cattell and Neil W Swinton <i>Diseases of the Stomach</i> Drs Frank H. Lahey and Samuel F Marshall <i>Esophageal Disease</i> Drs Walter B Hoover and Harry J Richter <i>Popliteal Herniation of the Knee Joints</i> Dr G Edmund Haggart. From the Lahey Clinic	73, 74
<i>Million Volt X Ray Machine</i> Drs Richard Dresser and Jack Spencer	76
<i>Cancer Exhibit</i> From the New England Medical Center Drs William M. Shedden and James E. Fish	77
<i>Parathyroid and Bone Diseases</i> From the Massachusetts General Hospital Dr Fuller Albright	78
<i>The Treatment of Coniunion Fractures</i> Dr Gordon M Morrison	80 81
<i>American Red Cross Highway First-Aid</i> Massachusetts Regional Committee on Fractures of the American College of Surgeons Dr A William Reggio	83

MOVING PICTURES Third Floor

Reconstruction of Crippled Hands with a Demonstration of Some End Results Dr William E Browne.

Pneumonia The Massachusetts Department of Public Health

MEETINGS OF THE COUNCIL

The annual meeting of the Council, Wednesday, June 1, at 10.30 a m., in the Lobby Salon Other stated meetings in John Ware Hall, Boston Medical Library, 8 Fenway on the first Wednesdays of October and February

CENSORS MEETINGS

The censors for the several districts will meet for the examination of applicants for fellowship on the first Thursdays of May and November

The censors for the Suffolk district will examine applicants residing in that district and also applicants who are nonresidents of Massachusetts

Applicants for fellowship should apply to the secretary of the district society of the district in which they reside (have a legal residence), at least six weeks before the date of a given examination, taking with them their diplomas

SECRETARY S NOTICE

All communications as to membership, especially changes of residence and address, should be sent to the Secretary, who keeps a constantly corrected official list of the fellows and their addresses

Fellows are requested to see that their names and addresses are entered correctly in the *Annual Directory* and when they move to notify the Secretary The *Annual Directory* will be sent only to paid up fellows who request it.

TREASURER'S NOTICE

Assessments, payable in advance, should be paid to the district treasurer, or, in the case of nonresidents, to the Treasurer

Assessments were due January 1 For the convenience of fellows who have not yet paid, such assessments will be received for the Treasurer at the Registration Desk.

COMMERCIAL EXHIBITORS

	Booth No
Allkalol Company	Table 1
Allergia Products Company	15
American Hospital Supply Company	4
Arlington Chemical Company	24
Baby's D Dee Service, Inc.	Table 2
Bard Parker Company, Inc.	17
Rudolph Beaver, Inc.	6
Ernst Bischoff Company, Inc.	49
The Borden Company	30
Burroughs Wellcome & Company, Inc.	20-21
Campbell X Ray Corporation	29
Coca-Cola Company	45
Crosbie Macdonald Company	18
Davies, Rose & Company, Ltd.	47
Denver Chemical Company	38
DeVilbiss Company	13
C B Fleet Company, Inc.	1
Form Publishing Company	28
General Electric X Ray Corporation	22
Gerber Products Company	36
H J Heinz Company	51
Horlick's Malted Milk Company	31
Hynson, Westcott & Dunning	33
S Israel's Correct Shoes	41
Jones Metabolism Equipment Company	8
Lederle Laboratories, Inc.	14
Lee De Forest Laboratories, Inc.	34
Libby, McNeill & Libby	5
Liebel Flarsheim Co	Table 3
M & R Dietetic Laboratories, Inc.	46
Macmillan Company	12
E. F. Mahady Company	19
Mead Johnson & Company	2
Medical Protective Company	37
Mellin's Food Company	16
Merck & Company, Inc.	11
C V Mosby Company	44
E. L. Patch Company	23
Petrolagar Laboratories, Inc.	48
Philip Morris & Company, Inc., Ltd	40
Picker X-Ray Corporation	25 26
Sandoz Chemical Company	32
E. R. Squibb & Sons	43
Surgeons and Physicians Supply Company	7
Tailby Nason Company	39
United Fruit Company	9 10
Westinghouse X Ray Company Inc.	50

White Laboratories 42
 Winthrop Chemical Company 3
 John Wyeth & Bro 27 and 35

COMMERCIAL EXHIBITS

Table No

1 The Alkalol Company, Taunton, Massachusetts

Alkalol is an alkaline, saline solution. The pH test shows that the hydrogen ion concentration of Alkalol closely approximates that of the blood plasma. Alkalol is hypotonic. Alkalol does not irritate. Its use is indicated in inflammatory lesions of the eye, ear, nose, throat, bladder and vagina. It is a mucus solvent.

Irrigol is a carefully blended powder which dissolved in recently boiled water makes an alkaline, aseptic, non toxic and slightly astringent solution. It is a cleansing and soothing irrigant for vaginal douching, colonic flushing, rectal enemas or wherever copious irrigation is desired.

2. Baby's Dy Dee Service, Incorporated, Brookline, Massachusetts

This exhibit will explain in detail the specialized equipment and the methods used in sterilizing and supplying diapers to homes in Greater Boston. Starting a fifth year this service has relieved hundreds of mothers and nurses of the daily drudgery of washing diapers and baby clothes, at the same time protecting baby's health by a scientific process impossible at home. An economical service devoted exclusively to the baby.

3 The Liebel Flarsheim Company, Cincinnati, Ohio

Will exhibit short-wave generators as well as Bovie electrosurgical units. L-F equipment is the product of electromedical specialists in business over twenty years. L-F electrosurgical apparatus has for many years been regarded generally as most dependable and is now in use by leading institutions and surgeons throughout the world.

Mr Arnold Williams will be in charge.

Booth No

1 The C B Fleet Company, Incorporated, Lynchburg, Virginia

Phospho-Soda (Fleet) has come to occupy a significant position wherever sodium phosphates or other laxative salines are indicated. It is a pure, stable aqueous concentrate of sodium phosphates with a history of forty-five years of manufacture.

The C B Fleet Company takes this opportunity to thank the medical profession for the broad usage and increasing recognition given to their single product, Phospho-Soda (Fleet). It is offered as an eliminant, with the advantages of ease of administration, rapidity and smoothness of action, and of being a buffer solution.

Mr R. S. Carman, New England representative, will be in charge.

2 Mead Johnson & Company, Evansville, Indiana

Mead Johnson & Company are distributing this year an unusually fine souvenir item. It is not only beautiful but extraordinary because it contains no advertising. Ask for your copy of 'Paragon'.

The complete display of Mead products includes two new ones.

3 Winthrop Chemical Company, Incorporated, New York City

Details regarding the new specifics for streptococcal, meningococcal, gonococcal and nonspecific urinary infections, Prontosil and Prontylin, will be available in the Winthrop Chemical Company's booth. Other new Winthrop preparations to be displayed: Betaxin, synthetic vitamin B₁, Drisdol, crystalline vitamin D₂, Evicyl, sedative analgesic, Iocapral, vasodilator for hypertension and angina pectoris, Campolon, injectable liver concentrate.

4 American Hospital Supply Corporation, Chicago

If you are planning to visit the annual meeting of the Massachusetts Medical Society be sure to save plenty of time to see what is waiting for you at Booth 4. The American Hospital Supply Corporation is showing an unusually interesting array of brand new specialties in surgical and hospital equipment. You are sure to come away with some new ideas about oxygen therapy, intravenous solutions, blood transfusions and a lot of other important phases of your work. Mr. Watson E. Hovis will be glad to see you and show you around. Remember you have an appointment at Booth 4.

5 Libby, McNeill & Libby, Chicago

Baby's first solid foods should be well tolerated and easily digested. Libby's Homogenized Baby Foods are ideal for early feeding because in addition to being strained they are given an extra process—homogenization. We invite you to visit the Libby exhibit to sample fruit juices and to register for samples of Libby's Baby Foods.

6 Rudolph Beaver, Incorporated, Waltham, Massachusetts

The important things that make good surgeons' knife blades are proper heat treating of steel, and a good sharpening process. These have been achieved in the Beaver Knife, made by Rudolph Beaver, Incorporated. Beaver blades are not wafer blades, but are strong and thick blades. The mechanism is the simplest and best. All the various blade shapes fit the different stainless steel handles. They are approved by the American College of Surgeons.

7 Surgeons and Physicians Supply Company, Boston

The Surgeons and Physicians Supply Company will exhibit the Comrex Short Wave Outfit, manufactured by the American Cystoscope Makers, Incorporated, and also a line of cystoscopes and catheters manufactured by them. They will also exhibit the new McKesson Pneumothorax, the new Castle office light and a line of new and interesting instruments and accessories.

8 Jones Metabolism Equipment Company, New York City

The Jones Motor Basal is the only waterless metabolism machine on the market. These features enable us to guarantee the machine for the life of the original purchaser. No corrections or calculations for barometric pressure or room temperature are required. No calculations are required to determine the basal metabolism. An exclusive geometric device checks the accuracy of each test. Saving in cost of oxygen, soda lime and tracing sheets pays for the entire cost of the machine.

9-10 United Fruit Company, New York City

You are cordially invited to visit the United Fruit Company's booths and sample a refreshing, banana milk shake, made before your very eyes from fresh ripe bananas mixed with cold milk and vanilla ice cream. Here also you will find the latest information, developed by research, on the food value and the varied uses of bananas.

11 Merck & Company, Incorporated Rahway, New Jersey

Vitamin C, an essential dietary constituent, will be the featured display at the Merck booth.

Individuals who are on a restricted diet frequently require a supplemental quantity of vitamin C. To be positive that they obtain the necessary amount and to be assured that the benefit of accurate dosage is derived, vitamin C is best prescribed in the form of Cebione. Cebione is the only vitamin C available that is Council accepted.

For information regarding Cebione, please register at the Merck booth.

12 The Macmillan Company, New York City

Our representative will be glad to discuss with you any of our recent books in the fields of medicine and surgery. You will want to see particularly our three new Macmillan medical monographs—*Digestive Tract Pain* by Chester M. Jones of the Massachusetts General Hospital, *Leukemia and Allied Disorders* by Claude E. Forkner, and *Orthodiagnosis* by Chester M. Kurtz. Also a Macmillan surgical monograph published recently—*Arteriovenous Aneurysm* by Emile Holman. You will be interested, too, in many of our new books of a more general nature, such as *Syphilis, Gonorrhea and the Public Health* by Nels A. Nelson and Gladys L. Crain, both of the Massachusetts Department of Public Health, *Alcohol One man's meat*, by Edward A. Strecker and Francis T. Chambers, Jr., *The Conquest of Cholera* by J. S. Chambers, and *The Life of Chevalier Jackson—An autobiography*.

Mr. Frank G. Hatfield will be our representative.

13 The DeVilbiss Company, Cleveland, Ohio

The complete DeVilbiss line of atomizers, steam vaporizers and nebulizers will be on display. Specially featured in the exhibit are illustrations graphically showing the superior coverage afforded by the atomizer in the application of solutions to the nose and throat. These illustrations are based on x-ray research.

Copies of the illustrations, for reference, may be secured from Mr. E. Manning, DeVilbiss representative in charge of the display.

14 Lederle Laboratories, Incorporated, New York City

Lederle Laboratories, Incorporated, will exhibit biological and pharmaceutical specialties of particular interest. Featured biologicals will be the newer types of pneumonia serum available and scarlet fever antitoxin. The pharmaceuticals to be emphasized will be liver extracts showing the new U.S.P. units.

15 Allerga Products Company, Newton, Massachusetts.

The exhibit of Allerga Bedding intended for the relief of sufferers from asthma, hay fever and related disorders will include a demonstration of dust pro-

duced by ordinary bedding fillers—cotton, kapok, feathers and hair—and will, by comparison, show the dust-free qualities of Allerga pure silk, filling material.

The exhibit will also feature full sized, non-atopic dust-free Allerga Pillows and a model of the dust-free Allerga Mattress.

We shall invite physicians to avail themselves of free vials of an extract made from Allerga Filling Material for their use in making scratch tests.

Of unusual interest, we believe, is our demonstration, which shows kapok (erroneously called silk floss) to be fully as prolific a dust producer as any other bedding filler, yet which for many years has been mistakenly recommended to dust sensitive patients.

Included with our showing of dust-free Allerga bedding is the Kantwet Crib Mattress, which not only offers a wetproof non rubberized infant bedding piece, but also a dustproof protection to sensitive nasal membranes.

16 Mellin's Food Company, Boston

Fitting the food to the baby, the correct approach to bottle feeding, is the underlying principle of the easily workable method that employs Mellin's Food as the milk modifier. A discussion of this matter with physicians is sincerely desired, and your visit to the Mellin's Food Company's exhibit will be greatly appreciated.

17 Bard Parker Company, Incorporated, Danbury, Connecticut

Among the Bard Parker products exhibited are rib-back blades, renewable-edge scissors, stainless steel, Lahey, lock forceps, Formaldehyde Germicide, containers for rustproof sterilization of surgical instruments and a hematological case for obtaining blood samples at the bedside.

18 Crosbie Macdonald, Boston.

Insurance service for members of the Massachusetts Medical Society.

Ask us to explain our plan for your own old age. Mr. Crosbie will be in charge.

19 E. F. Mahady Company, Boston.

The E. F. Mahady Company exhibit will include recent developments of the Burdick Company in the field of physical therapy, a display of Cutter Intravenous Solutions in Safteflask containers, and other items of interest to the medical profession.

20-21 Burroughs Wellcome & Company, Incorporated, New York City

The Burroughs Wellcome & Company exhibit presents a wide range of new and important advances in pharmacological and chemical research.

22 General Electric X-Ray Corporation, Boston

It is the policy of the General Electric X-Ray Corporation to try, at each meeting of the Massachusetts Medical Society, to have an interesting exhibit for the visiting doctor. All we ask is that he pay us a visit and meet our representatives who are very helpful in the matter of x-ray and physical therapy problems.

23 The E. L. Patch Company, Stoneham, Massachusetts

The Patch Company representatives will be on hand throughout the convention ready to greet physicians and to be of service in any way. The Patch Com-

pany exhibit will include Patch's Cod Liver Oil, as well as the other ethical medicinal specialties made in the Patch Laboratory

- 24 The Arlington Chemical Company, Yonkers, New York.

The Arlington Chemical Company will again exhibit its products at the annual meeting of the Massachusetts Medical Society. It will again feature its biological and pharmaceutical products. The company is offering a new diagnostic protein outfit that has just been released consisting of eighty of the most common causative factors in allergic conditions. The physician in charge of the booth will be happy to discuss any allergic problem.

- 25 26 Picker X Ray Corporation, New York City

The Waite Series "200" Radiographic and Fluoroscopic X-Ray Apparatus will be displayed. This is the first completely self-contained, oil immersed valve tube equipment to be presented to the radiographic profession. The new Waite Series "200" delivers 200 ma. from over as well as under the table, and is instantaneously available for radiography or fluoroscopy either in the horizontal or vertical position. It is self-contained by virtue of the fact that no overhead system is necessary as a four-valve, portable, hermetically sealed transformer is standard with the apparatus.

Other features of our display will be certain accessories, such as Keraphen (the standard gall-bladder dye), Basolac (for gastrointestinal examination), Picker lead rubber gloves and Picker fluoroscopic goggles.

As one of the largest exclusive manufacturers of x ray apparatus, we are very happy to appear at the annual meeting of the Massachusetts Medical Society in the interest of x ray therapy and radiographic advancement.

- 27 and 35 John Wyeth and Brother, Incorporated, Philadelphia.

John Wyeth and Brother, Incorporated, will exhibit a number of their pharmaceutical specialties, including Silver Picrate, Council-accepted treatment for *Trichomonas vaginalis* vaginitis, Kaomagma, the intestinal adsorbent, Amphojel, Wyeth's alumina gel (antacid), and Ergoklonin, Wyeth's preparation of the alkaloid ergonovine, the specific oxytocic principle of ergot.

One of the points of interest at the booth will be a glass model of *Trichomonas vaginalis*, which has been exhibited at several medical meetings throughout the country. This model stands approximately ten inches tall, is of sufficient size in all the delicate inner structures so that this protozoon may be studied at leisure.

- 28 Form Publishing Company, New York City

The Collens System of Diet Writing is a loose leaf system containing the Collens Diet Calculator, an obesity chart, a diet formulary and one hundred menu prescriptions.

Book reviews have uniformly acclaimed it as the simplest, most ingenious and most practical contribution to the problem of diet writing for the physician. The calculator can be used for any diet requiring a quantitative consideration of carbohydrate, protein and fat, such as in diabetes, nephritis, nephrosis and epilepsy. The menu sheets are most practical for the patient.

See this ingenious system in the Form Publishing Company booth

- 29 Campbell X Ray Corporation, Boston

We shall exhibit the latest development in shock proof x ray apparatus and accessories

- 30 The Borden Company, New York City

New, yet already remarkably successful in infant feeding, Biolac is exhibited for the first time in Massachusetts at the Borden booth. Competent representatives will gladly provide specific, helpful information on the unique virtues of this modern, complete infant food.

Also exhibited are other Borden products, notably Dryco, Klim, Beta Lactose, Merrell-Soule Products and Borden's Irradiated Evaporated Milks.

- 31 Horlick's Malted Milk Corporation, Racine, Wisconsin

Nourishing, digestible, appetizing—these are three outstanding qualities for which Horlick's Malted Milk is famous, in either the powdered or tablet form. Visit Booth 31. You will be interested in the many dietary uses—from infant feeding to old age, note especially the convenience of the tablets for interval feeding in ulcer diets.

- 32 Sandoz Chemical Works, Incorporated, New York City

We will feature Digilanid, a chemically pure and constant preparation of the three isomorphous crystal line initial glucosides of *Digitalis lanata*, designated as lanatosids A, B and C, Digilanid tablets and liquid are available for oral dosage, suppositories for rectal administration, and stable ampule solutions for intramuscular and intravenous injection. Among other products displayed will be Bellergal, a pharmacodynamically balanced association of active neurotropic drugs, for the treatment of functional nervous disorders, neuroses and imbalances of the vegetative nervous system, Gynergen, the original and only product of the specific ergot alkaloid ergotamine, in pure and stable form for dependable uterine hemostasis and the non-narcotic relief of migraine, Calglucon, the pioneer brand of calcium gluconate in chocolate flavored tablets, effervescent tablets and granules for palatable oral calcium medication, as well as 10 and 20 per cent, stable, sterile ampule preparations of Neo-Calglucon for intensive parenteral calcium therapy, Scillaren, a brand of pure squill glucosides, a reliable cardiodiuretic.

- 33 Hynson, Westcott & Dunning, Incorporated, Baltimore

We shall have an exhibit featuring Mercurochrome and various pharmaceutical specialties of our manufacture. There will also be a display of some of the diagnostic apparatus and ampule solutions which have been developed in co-operation with physicians. As usual, competent representatives of the company will be in attendance to demonstrate the products and to answer questions. Literature and samples will be available to physicians who are not already familiar with products exhibited or who wish to obtain a trial supply.

- 34 Lee De Forest Laboratories, represented by the New England X Ray Corporation, Boston

Lee De Forest Laboratories are manufacturers and distributors of radio-frequency apparatus and feel that

- it is in their province to be principally concerned in the continued and persistent efforts to develop, for this new form of therapy and surgery, apparatus which carries a guarantee that can be relied upon and also a license under existing valid patents. After many months of exhaustive research in the field of radio-electronics, Lee De Forest now offers to the profession the 1937-1938 Dynatherms. Mr. George Laben and Mr. Dean Allen will be in charge of the exhibit.
- 36 Gerber Products Company, Fremont, Michigan
Gerber invites you to inspect its strained food, which will be on display. Two kinds of literature, some for professional use and some for distribution to mothers or adult patients on therapeutic diets, are both available for your examination and will be sent to you on request.
- 37 The Medical Protective Company, Wheaton, Illinois
The Medical Protective Company's representative, thoroughly trained in professional liability underwriting, invites you to visit Booth 37. He is entirely familiar with the principles of the reciprocal rights and duties of a doctor and patient and with the circumstances peculiar to that relation. He will be glad to explain how his company meets the exacting requirements of adequate liability protection, which are peculiar to the professional liability field.
- 38 The Denver Chemical Manufacturing Company, New York City
In Booth 38, Antiphlogistine will be exhibited. This product, now in its forty-fifth year, is employed by physicians in all parts of the world. It is a really universal product. Galatest will also be exhibited; this is a new microreagent for the instantaneous detection of urine sugar. Physicians are invited to visit the exhibit.
- 39 Talby-Nason Company, Boston.
The Giant Cod and photographs of the Lofoten Fisheries in Norway will be an interesting part of the exhibit of Nason's Palatable Cod Liver Oil. Mr. Robert Nason will be in charge.
- 40 Philip Morris & Company, Limited, Incorporated, New York City
Philip Morris & Company, Limited, Incorporated will demonstrate the method by which it was found that Philip Morris cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than other cigarettes.
- 41 S. Israel's Correct Shoes, Incorporated, Boston
The value of S. Israel's Correct Shoes is recognized by the medical profession at large, and they are prescribed as a mechanical medicant in assisting the doctor in the banishment of the various bodily disturbances that are largely due to tarsus misplacement from faulty and incorrect footwear. These shoes are constructed of the finest materials obtainable on lasts that were developed by scientific measurements from feet in their individual classes and their various shapes and contours. They are assembled by expert craftsmen of a well-known shoe manufacturer, who is equipped to make shoes of this nature, and who has had fifty-five years' experience in making high-grade footwear.
- 42 White Laboratories, Incorporated, Newark, New Jersey
Information covering the cod liver oil field, together with clinical and biochemical evidence of the efficacy of the company's liquid, tablet and capsule forms of cod liver oil, will be presented by White Laboratories, Incorporated. Informed representatives and descriptive booklets, reprints and excerpts from the literature will further point out the contributions of White Laboratories, Incorporated, to the field of vitamins.
- 43 E. R. Squibb & Sons, New York City
Physicians attending the Massachusetts Medical Society meeting are cordially invited to visit the Squibb Exhibit in Booth 43.
The complete line of Squibb glandular, vitamin, arsenical and biological products and specialties, as well as a number of interesting new items, will be featured.
Well-informed Squibb representatives will be on hand to welcome you and to furnish any information desired on the products displayed.
- 44 The C. V. Mosby Company, St. Louis
Among the many books to be displayed by the C. V. Mosby Company are the second edition of Watson's *Hernia Reas Neuro-ophthalmology*, the fifth edition of Porter and Carter's *Management of the Sick Infant*, the fifth edition of Crossen's *Operative Gynecology*, and the sixth edition of Clendening's *Method of Treatment*. These recent releases will be supplemented by approximately one hundred seventy-five other texts.
- 45 The Coca-Cola Company, Atlanta, Georgia
The Coca-Cola Company in serving complimentary Coca-Cola at its booth hopes that "The Pause That Refreshes" will be enjoyed by guests and visitors of the meeting.
- 46 M & R Dietetic Laboratories, Incorporated, Columbus, Ohio
M & R Dietetic Laboratories, Incorporated, will display Simlac, a completely modified milk for infants deprived of breast feeding. Representatives will gladly explain its merit and suggested application.
- 47 Davies, Rose & Company, Limited, Boston.
The preparations that this firm is exhibiting have a world-wide reputation. Physiologic or chemical tests are made to insure their standardization. Clinical experience vouches for their dependability.
- 48 Petrolagar Laboratories, Incorporated, Chicago
Physicians are cordially invited to visit Booth 48 where Petrolagar Laboratories, Incorporated, will be represented by Messrs. Larson and Schneider.
Petrolagar is an emulsion of pure mineral oil (65 per cent by volume) and agar-agar, accepted by the Council on Pharmacy and Chemistry of the American Medical Association for the specialized treatment of constipation. Scientific drawings and literature on the subject of constipation will be available in addition to samples of the five types of Petrolagar.
- 49 Ernst Bischoff Company, Incorporated, Norvton, Connecticut
In our exhibit we will feature Actavin, the first American produced, shockless, foreign protein for non

specific therapy, Alpha Lobelin, a direct stimulant to the respiratory tract and the resuscitant indicated in all forms of respiratory failure or depression, Diatussin, the original drop-nose cough remedy with a thirty-five year record of efficacy, Silvogon, an absolutely stainless silver antiseptic, an effective gonocide, Styptysate, a vegetable hemostatic for the control of all seeping hemorrhages, Viscysate, a dialysate of viscum album which lowers blood pressure and relieves the accompanying symptoms

- 50 Westinghouse X Ray Company, Incorporated, Long Island City, New York.

The latest model Diadex Portable shown by the Westinghouse X Ray Company is an excellent example of the power and flexibility which modern engineering has built into today's compact, shock proof x ray equipment.

We also have on display the new Westinghouse Bactericidal Lamp

- 51 H J Heinz Company, Pittsburgh, Pennsylvania

In order that you may see the natural fresh color and uniform consistence of Heinz Strained Foods our display presents in an attractive manner all twelve varieties. Naturally, you have some questions as to their preparation and uses. We therefore invite you to let our representative serve you, in this respect.

We shall be glad to send you a copy of the fifth edition of our 'Nutritional Chart' upon registration at our exhibit.

ROUND TABLE CONFERENCE ON HIGHWAY FIRST AID

On Tuesday, May 31, at the time of the annual meeting of the Massachusetts Medical Society, there will be a meeting of the members of the Massachusetts Fracture Committee of the New England Regional Fracture Committee of the American College of Surgeons at the Hotel Bradford in the Lounge Ballroom from 3 to 5 p. m.

This Round Table Conference is for the purpose of hearing reports from various members as to the Highway First Aid Stations of the Red Cross in their districts and as to what has been accomplished, to date, as regards first aid equipment of ambulances and first aid instruction of ambulance drivers, local police, and so forth.

There are now fifty nine members on the Massachusetts committee, which was formed in November, 1936. Further organization of the group will be discussed in order that this committee may function more adequately and thus succeed in accomplishing the end for which it was formed.

There will be a few very short talks and the remainder of the session will be taken up by open discussion in which any member with constructive ideas is urged to take part.

A. WILLIAM REGGIO, M.D., *Chairman*
Massachusetts Fracture Committee

NEW ENGLAND ALUMNI— LUNCHEON MEETING

BALTIMORE MEDICAL COLLEGE, COLLEGE OF PHYSICIANS AND SURGEONS, UNIVERSITY OF MARYLAND MEDICAL SCHOOL

The annual luncheon meeting of the New England alumni will be held at the Hotel Statler, Wednesday, June 1, at 12 30 p. m.

CHARLES E. GILL, M.D., *Secretary*

MASSACHUSETTS MEDICO LEGAL SOCIETY

There will be a meeting of the Massachusetts Medico-Legal Society on Wednesday afternoon, June 1, in the Oval Room of the Hotel Bradford, at 2 30

PROGRAM

Business Meeting

Brief Presentation of Occupational Hygiene. Dr. Arthur B. Emmons, 2nd

Medico-Legal Aspects of Diabetes and Hyperinsulinism
Dr. Shields Warren

Dr. Timothy Leary, moderator, will receive and answer questions concerning puzzling points which occur to every medical examiner, and will also interpret the laws

NATHANIEL POPE BREED, M.D.,
President,

MYRTLE M. CANAVAN, M.D.,
Secretary-Treasurer

HARVARD MEDICAL ALUMNI ASSOCIATION

The luncheon and annual meeting of the Harvard Medical Alumni Association will be held at the Hotel Bradford, on Tuesday, May 31, at 12 30 p. m. The meeting preceding the luncheon will be brief. Dean Burwell will speak.

Tickets for the luncheon will be on sale at the Registration Desk, the charge being \$1 00

TUFTS MEDICAL ALUMNI LUNCHEON

A buffet luncheon for the alumni and friends of Tufts College Medical School will be held on Tuesday, May 31, at 12 15 p. m. at the Hotel Bradford.

Those planning to attend should communicate with the secretary, Dr. Robert T. Phillips, 386 Commonwealth Avenue, Boston

OBITUARY AND RESOLUTIONS

FREDERIC JAY COTTON

1869-1938

The Massachusetts Medical Society has recently lost one of its most distinguished members, Dr. Frederic Jay Cotton.

Born in Prescott, Wisconsin, son of Joseph Potter and Isabella Cole Cotton, Dr. Cotton was educated at Harvard College (A.B., 1890, and A.M., 1894) and Harvard Medical School (M.D., 1894). He became a surgical intern at the Massachusetts General Hospital and then studied in Vienna and visited various European clinics for two years.

He was next appointed a visiting surgeon at the Boston City Hospital. Dr. Cotton advanced through various grades of rank, eventually becoming senior surgeon-in-chief and chairman of the Surgical Staff, and subsequently, consulting surgeon, in which position he served faithfully and well for many years. At one time he was surgeon-in-chief at the Beth Israel Hospital and was a teacher of surgery at both Harvard Medical School and Tufts College Medical School. For some time

he was a visiting surgeon at the Children's Hospital

Dr Cotton practiced general surgery in his early years but later became interested in fractures, bone and joint surgery, and industrial and plastic surgery. His many valuable contributions to medical literature in these fields of surgery are a monument to his skill and ingenuity. His textbook on *Fractures and Dislocations* has been used throughout the country as a standard by countless students and members of the profession, he drew practically all the illustrations in this book. His own vast experience and progressive views derived from an extensive practice were ably expressed in his writings.

He established the Bone and Joint Service at the Boston City Hospital, becoming the first surgeon-in-chief of the Sixth Surgical Service. At this time he limited his operating to bone and joint cases exclusively, and for many years personally followed up his patients in the Outpatient Department.

Doctor Cotton was particularly interested in hip fractures, and he was one of the first surgeons to abduct the leg and artificially impact the broken hip. Cotton's fracture of the ankle was ably described by him many years ago, and his classification of ankle fractures has been widely accepted. Many years ago his advanced ideas permitted him to evacuate infected joints and suture them without drainage, which was an unheard-of procedure at that time.

He originated many novel methods of operating, and was one of the first surgeons in the country to recognize the disabling character of fractures of the wrist and of the os calcis and to devise methods for their correction. Acute flexion position for elbow injuries and internal fixation for fractures were early advocated by him. He was a pioneer in creating modern gas-oxygen machines for anesthesia, in conjunction with Dr Boothby. The modern Gwathmey and Foregger machines are patterned after Dr Cotton's ideas.

Doctor Cotton served his country with distinction in the Spanish War and in the World War, being commissioned a major in the Medical Corps, United States Army. He was appointed surgeon-in-chief of the Walter Reed Hospital and subsequently acted in the same capacity in Boston at the Elks Reconstruction Hospital. He was also an assistant and a valued adviser to the Surgeon-General.

As a founder and member of the Board of Regents of the American College of Surgeons and of the American Board of Surgery, Doctor Cotton exerted a great amount of influence in raising the standards of surgery and of hospitals in America. He was also a senior member of the Ameri-

can Surgical Association and of the American Orthopedic Association.

His versatility was shown by his excellent work in sculpture, etching, and water-color and oil painting. He was a charter member of the Boston Physicians' Art Society and arranged their annual exhibits.

His widow, Jane Baldwin Cotton, and a daughter survive him, as well as two grandchildren.

Doctor Cotton endeared himself to his countless patients and associates because of his unfailing good nature and his kindly advice and generous help to those in trouble. He was always willing to lend a helping hand and to give invaluable advice to the younger generation.

Of powerful build, impressive appearance and commanding personality, Doctor Cotton combined many rare qualities which resulted in making him a skillful and successful surgeon of national reputation.

W R M

RESOLUTIONS ON THE DEATH OF BENJAMIN WHITE

WHEREAS, Dr Benjamin White was an active member of the Association for thirteen years (1921 to 1934), and

WHEREAS, in recognition of his services, he was made an honorary member of this Association when ill-health necessitated limitation of his activities, and

WHEREAS, his industry and zeal in promoting the public health of Massachusetts not only by his direction of the preparation of biologic products but also through his interest in the extension of programs for active immunization against small-pox and against diphtheria and through the initiation of a plan for the study of pneumonia and its control led to strengthening and improving public-health work in this Commonwealth, therefore be it

RESOLVED, by this Association, assembled in regular meeting, that it records in its minutes its sense of regret in the loss to the Association and to the advancement of the public health occasioned by the death of its distinguished member and be it further

RESOLVED, that copies of this resolution be transmitted to the appropriate journals for publication, and to his widow to whom the Association extends its deep sympathy.

Unanimously adopted by a rising vote at a meeting of the Massachusetts Public Health Association held April 27, 1938.

G DONALD BUCKNER
Secretary

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS
AND GYNECOLOGY

M FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No 72 BLEEDING IN THE TWENTY-
EIGHTH WEEK OF PREGNANCY

Mrs J W, twenty-four years old, in the twenty-eighth week of her first pregnancy, passed, without any pain, what she estimated as a quarter of a cup of bright-red blood and a small clot. She was sent at once to the hospital.

Her family history was unimportant. In childhood, she had had a hemolytic streptococcus throat. In 1927 her tonsils and adenoids were removed. In July, 1935, a dilatation and curettage, plastic on the cervix, suspension and appendectomy were performed. Catamenia began at fourteen, were regular every twenty-eight days, and lasted four or five days. She had had severe cramps until the operation in 1935. Her last period began October 23, 1935, making her due for delivery July 30, 1936.

She was first seen December 17, at which time the lungs were clear, there were no rales, the heart showed no enlargement and there were no murmurs. Her blood pressure was 122 systolic, 70 diastolic. The urine contained no albumin or sugar. Abdominal examination was negative except for a median scar below the umbilicus. Vaginal examination showed a marital introitus, the cervix was soft and smooth, and the uterus in normal position, definitely a little large and globular. The vaults were free, and there was no erosion of the cervix. Her pelvic measurements were 30-24-20, the symphysis and arch were normal, and the outlet ample. She was seen routinely during her pregnancy which progressed satisfactorily and normally until the above-mentioned bleeding on May 10.

On arrival at the hospital her blood pressure was 118 systolic, 66 diastolic. The urine specimen contained no albumin or sugar. The fundus measured 27 cm above the symphysis. The fetal heart was heard in the right lower quadrant. By palpation the vertex was presenting above the brim. Her red-cell count was 3,650,000, white-cell count 11,200, and the hemoglobin 69 per cent. The patient's blood was typed and found to be incompatible with that of her husband. She was not flowing on admission to the hospital, and no vaginal examination was made. The diagnosis lay

between separation of a low-attached placenta, slight separation of a normally attached placenta, or some type of placenta previa. As the baby had a less than 50 per cent chance of survival if delivered and the patient was able to stay in the hospital until the baby was viable, it was decided to follow this course. There was no flowing after the time of her admission.

On June 11 a cystogram was taken after the injection of 40 cc of a 3 per cent solution of sodium iodide into the bladder. The x-ray plate showed the fetus presenting by the face, probably a posterior face, the distance between the bladder and the head was 18 mm. On the right side and in the central portion of the bladder outline there were two levels of density indicating that portions of the center and right side of this area were occupied by an unusual soft-tissue mass. An x-ray diagnosis was made of partial placenta previa on the left with brow presentation. On June 27 the patient was examined vaginally. Everything was in readiness for the insertion of a bag or a cesarean section. Vaginal examination showed that the head was down against the cervix and that apparently nothing was in front of it. The cervix was short and easily admitted one finger. A finger was passed through the cervix and came directly against the vertex. The finger was swept around for a distance of 5 cm above the internal os and no placenta was felt. This examination ruled out any type of placenta previa. As a result of this examination she started in labor very soon. All through that day she had definite contractions lasting from three to five minutes, but there was no show, and not much discomfort. At 4 00 p m a rectal examination showed the cervix to be short, about one and a half fingers dilated, and the head down against it. The membranes ruptured spontaneously at 9 00 p m, after which the pains became harder and occurred every three minutes. She had a normal labor which terminated at 1 14 the next morning with the delivery of a male child, weighing 6 lb, 7 oz., in excellent condition. There was a small median tear which was repaired. The placenta separated and was expressed intact with membranes complete. The placenta showed evidence of an old partial separation, the membranes had ruptured 15 cm from the edge of the placenta. There was no unusual bleeding, and both mother and baby were in excellent condition.

Comment The conservative handling of cases that bleed at a period when viability is very questionable and when the bleeding entirely ceases is well illustrated by this particular case. If an examination had been made and the finger put through the cervix for the purpose of making

an absolutely definite diagnosis and if a central placenta previa had been present, bleeding might have been so great that immediate delivery would have been indicated, if such were the case, the chance of obtaining a living child would have been small. If this patient had bled again while she was in the hospital, then an examination would have been imperative so that an exact diagnosis upon which intelligent treatment might be instituted, could be made. A patient at this stage who bleeds painlessly, may bleed from the separation of a normally situated placenta, a low-attached placenta or placenta previa of any one of the three types. Cystograms have been used for the last few years for the purpose of making a diagnosis of placenta previa. In this instance the x-ray diagnosis was definitely wrong. This patient was treated ideally and a perfect result was obtained.

THE PRE-SCHOOL CHILD

In these modern times it is a little difficult to define exactly the pre school stage of life, when so many children arrive at the nursery school door practically dragging their cradles with them. The social, if not the legal, term of infancy is construed as occupying the first two years of life, with children of three seeking and gaining admission to the nursery schools in rapidly increasing numbers. It would appear that the period of life concerning which we are to talk frequently consists of but a year in the life of the individual.

It may be just as well, however, since this is the period of the child's life that has long been termed "The Neglected Age," that it should be made as short as possible. The very fact that it is being shortened shows that we have become conscious of its needs.

During the infancy of the child its most urgent demands are physical ones. It protests when it is uncomfortable, hungry or in pain. It makes its wants felt and they are attended to. We are in danger of forgetting the fact that an infant has more needs than a stomach to be filled and a diaper to be changed, that its mind requires, from its earliest months, lessons in adapting itself to the environment in which the individual must live.

When pre school days are reached, when the quadruped infant becomes the biped runabout child, the necessity of training him forces itself upon us. Originally in danger of regarding the infant as a body without a mind, we now run the risk of regarding the pre school child as a mind without a body—an equally serious error.

Actually, at every age of childhood our obligation as parents, as teachers as nurses or as physicians is to try and maintain a just balance between those mutually reciprocal parts of the human entity—the mind and the body.

Various necessities present themselves to us in this period of rapid development of the child—the period from two to five or six, to accept the more orthodox school age. We are in danger now of neglecting the diet, which had been so carefully overseen during the child's infancy, not only in allowing unsuitable foods, but in failing to include principles necessary for healthy growth. We are a nation of carbohydrate eaters, and our appetite for this

class of foods—the starches and sugars—makes us liable to neglect the foods that contain in greatest abundance the necessary minerals and vitamins, that is, the fruits, the vegetables, milk and eggs.

A minimum basic diet for a growing child consists or at least a pint of milk a day, one or more cooked vegetables, a raw fruit or vegetable or both, eight ounces of some fruit juice, an egg or meat or fish, and some source of vitamin D, such as cod liver oil, at least during the winter and spring months. These basic requirements having been fulfilled, other foods such as the cereals, the breads, desserts, and so forth, may be used to satisfy the appetite and make up the energy requirements of the body.

I mentioned at least a pint of milk a day as a fundamental part of our basic diet. Children with normal, healthy appetites may drink as much as a quart, but I consider that the slogan "A quart of milk a day" has done considerable harm. Many children cannot take this amount of milk in a day without seriously interfering with their appetites for the other essential parts of the diet, and loss of appetite constitutes one of the major problems in dealing with many children of today.

This appetite problem must be met by reducing the quantity of milk, if milk is a food of choice, by stopping all eating between meals, by giving a well-balanced diet in small servings, but as attractively as possible, by limiting the time allowed for eating and by letting the child see plainly that his or her eating habits do not cause anyone any concern. This method of approach, however, is not tried for a day, a week or a month. It is an attitude that must be maintained permanently.

There is considerable evidence available that a sound basic diet is also a heavy contributor to the campaign for sound, healthy teeth, something in which civilized races are sadly lacking. Watch your child's six-year molars, the first of the permanent teeth that come in near the end of or soon after our pre school period. Those cavities to which they are so susceptible may be partly the result of a lack of orange juice, of milk or of cod liver oil during the years before their appearance.

Do you keep a dish of candy on the sideboard or the living room table? Perhaps this is responsible for that dental decay of his that you deplore so much, or have not even noticed, if toothache has not yet set in. Candy is permissible, yes, but only of very simple types and only after a meal that has been satisfactorily eaten.

The question of filling the cavities that have occurred in the temporary teeth is sometimes debated. Certainly there can be no reason for neglecting teeth that must serve a child during the ten or twelve years when his jaws are taking on their final shape and his life's health is in the making.

Many children will have been vaccinated against small pox and immunized against diphtheria during their first year of life, and that is the best age in which to have those immunizations performed. If they were neglected during infancy, however, they should be performed early in the pre school years, for universal immunization is a small price to pay for the practical banishment of two dread diseases. Immunization against other diseases such as whooping cough and scarlet fever may be attempted in individual instances, but is not yet being universally applied.

Those acute infectious diseases for which we have no effective immunization must, however, be guarded against by protecting our children, so far as possible, from exposure to them. The common cold in itself causes a great

A "Green Lights to Health" broadcast given by Dr. Joseph Garland on Wednesday May 4 and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

er loss of time from useful activity than does any other disease, and in childhood particularly, may be the apparent forerunner of many of the more serious illnesses. While the activity of the pre school child may not be considered as useful from the economic standpoint, we nevertheless do not like to see him deprived of it for even a short time because of preventable sickness.

While we are on the subject of acute infections, it is well to bear in mind that removal of the tonsils, particularly during the early years of life, does not open the gateway to perpetual health, nor does it necessarily prevent the further occurrence of common colds, swollen glands or fallen arches. The removal of tonsils should be considered as a major operation, to be accepted only on the merits of the individual case as the result of a decision carefully rendered.

Aside from the acute infections, one of the major enemies of early childhood is chronic fatigue, and as a result of chronic fatigue we are very likely to find poor body mechanics. The sway-backed, soft muscled, flat-chested, round shouldered child with protuberant abdomen and flat feet is almost surely a victim of chronic fatigue, and his faulty posture may be a contributory factor to his fatigue.

We live in an age of speed, pressure, anxiety and almost constant emotional stimulation, and our children need protection from it. Instead we allow them to abandon their daily rests at too early an age, to stay up too late at night and to seek overstimulating forms of amusement. The result is chronic fatigue and emotional instability, both of which seriously interfere with our efforts to cultivate their bodies, train their minds and help them to establish self-control.

I would recall to your minds the first two provisions of the Children's Charter, adopted as a bill of rights for the child at the White House Conference of 1930.

1 For every child spiritual and moral training to help him stand firm under the pressure of life.

2 For every child understanding and the guarding of his personality as his most precious right.

There is no assurance in these troublous days that we can hand down to our children very much in the way of tangible securities or concrete goods. We can, however, give them certain things that cannot easily be taken from them—good habits, self reliance, self respect, a security in right thinking and right living that in later life may help them to stand firm while their world seems to be falling about them. We would have them believe, like the old character in Hugh Walpole's *Fortitude* that it isn't life that counts, it's the courage you bring to it.

To do these things we must give them homes in which they can have a sense of spiritual as well as of economic security, we must teach them emotional stability by example rather than by precept, we must recognize the fact that social adjustment begins not in the school but in the cradle.

* * *

Q How much rest does a child of four require?

A The child of four years requires about twelve hours of sleep, or a little more, which means more than this length of time in bed. An interesting study made a few years ago by the University of Minnesota Institute of Child Welfare showed that more sleep is taken in the winter than in the summer, and that country children take less than city children. The length of night sleep from the age of two years through the age of seven remains practically stationary at eleven hours, so that the diminution in total sleep beyond the age of two is accounted for largely by the shortening and gradual abandonment of the nap. However, a midday rest, even if no sleep is taken, should be continued at least through the pre school years.

Q On what basis should a decision for or against the removal of tonsils be made?

A This is frequently a difficult question to decide, and yet it is one that comes up at least once in the lives of most children. I am hopeful that we are becoming increasingly more conservative in recommending the operation. Very little help can be gained by actually inspecting the tonsils. What is of greatest importance is the past health record of the child, particularly as regards frequent attacks of sore throat or tonsillitis, frequent ear abscesses or infection of the glands in the neck. Head colds cannot be prevented by tonsillectomy, but to a certain degree their complications may be. Thus, although children without tonsils may still have ear abscesses, sinus infection and gland infections, their chances of having them are somewhat reduced after tonsillectomy, provided that they had previously been particularly susceptible to them.

Favorable results from tonsil and adenoid removal seem to last about three years, after that period of time the benefits tend to disappear. Even where the operation seems to be necessary, it is well to delay it, if possible, until after the age of five or six.

Q Do you approve of nursery schools?

A Yes, on the whole I can say that I do approve of nursery schools, although the answer deserves to be guarded. Three factors are involved, the school, the child and the home. Enthusiasm alone cannot make a good school. Combined with it must be an understanding of the obligations involved and the duties to be performed. Such a school can be of service to a child who has no natural playmates or whose home environment needs to be supplemented. Naturally, no school can replace the home.

DEATHS

McMURRAY—FRANCIS M. McMURRAY, M.D., of 101 Prichard Street, Fitchburg, died at his home, May 8. He was in his sixty sixth year.

Born in Merrimack, he attended the Fitchburg High School, graduated from Brown University and received his degree from the New York University College of Medicine in 1899.

Before beginning practice in Fitchburg, in 1899, he was a reporter for the *Fitchburg Mail* and the *Fitchburg Sentinel*. For several years he was city physician and at the close of the last century was clerk of the city's common council. Dr. McMurray was president of the staff at the Burbank Hospital for many years and had been chief anesthetist at the hospital for several years. He was a fellow of the American Medical Association and the Massachusetts Medical Society, past president of the Worcester North District Medical Society and its secretary at the time of his death.

His widow, a daughter and a brother survive him.

WHEELER—CHARLES D. WHEELER, M.D., of Worcester, died May 7. He was in his seventy third year.

Born in Worcester he prepared for college under private tutors in Marblehead, and graduated from Williams College and from the Harvard Medical School. In 1893 he began practice in Worcester. In 1906 he became associated with the State Mutual Life Assurance Company as medical examiner and rose to the position of medical director, a position he held at the time of his death. He was at one time consulting surgeon at Worcester City Hospital, and served on the Federal Advisory Board during the World War.

Dr. Wheeler was a fellow of the American Medical As-

sociation, the Massachusetts Medical Society, the Worcester District Medical Society and the American College of Surgeons. He held memberships in the Worcester Club, the Worcester Chamber of Commerce and the Williams Club of New York City and was also a member of the Masonic Order.

His widow, a daughter, a son and a granddaughter survive him.

WINN—CHARLES H. WINN, M.D., of 808 Commonwealth Avenue, Newton Centre, died May 10. He was in his seventy-fifth year.

A native of Boston, he attended the Boston public schools, later graduating from Boston College and receiving his degree from the Harvard Medical School in 1888.

The first medical examiner ever appointed by the Aetna Life Insurance Company, he served fifteen years in that capacity. He was also medical examiner for the Boston Elevated Company. For ten years he was visiting surgeon at St. Elizabeth's Hospital and was appointed by President Cleveland to the United States Board of Examining Surgeons for Pensions.

Dr. Winn was a member of the American Medical Association and a fellow of the Massachusetts Medical Society.

Two daughters, a son and a sister survive him.

YOUNG—WILLIAM B. YOUNG, M.D., of 86 Fresh Pond Parkway, Cambridge, died May 11. He was in his fiftieth year.

Born in Rockland, he attended the Rockland High School, graduated from Harvard University and received his degree from the Harvard Medical School in 1918.

Dr. Young was a former resident surgeon at the Haymarket and East Boston relief stations. During the World War he was a captain in the medical corps and later became resident surgeon of the Boston City Hospital and visiting surgeon of the Boston Lying-in Hospital. He subsequently joined the staffs of the Cambridge Hospital and Cambridge City Hospital, which posts he held at the time of his death. For many years he was an instructor in the Department of Obstetrics, Harvard Medical School.

A fellow of the Massachusetts Medical Society, he was also a member of the American Medical Association.

His widow, a daughter, four brothers and two sisters survive him.

MISCELLANY

DIFFICULTIES IN DEALING WITH THE TUBERCULOSIS PROBLEM

DIFFICULTIES ENCOUNTERED IN INDUSTRY

According to Lane (*Tubercle* 19:97-104, 1937), enlightened industry nowadays realizes that it must carry a certain number of subnormal individuals. In the long run this is sound economic policy, for industry cannot afford to lose trained employees or to breed psychological unrest of workers caused by the knowledge that loss of employment will follow serious or prolonged illness. Yet the employment of workers who have tuberculosis, or have recovered from the disease, is an exceedingly awkward problem, for tuberculosis is insidious and infectious and leaves its sufferers incapable of normal physical effort for long periods.

Economic difficulties experienced by the tuberculous wage earner are serious. They are partially relieved by

continuing part wages. Treatment in the sanatorium is rendered easier and more effective if the worker is relieved of immediate worry and is given hope for the future. It reduces the temptation to return to work too soon.

Environmental difficulties are particularly acute in working-class areas. The problems of slums, overcrowding and undernourishment are being solved by the slow social evolution now going on.

Difficulties arising out of the patient's own attitude include (a) fear of losing his income, (b) fear of losing his job, and (c) fear of the sanatorium. These fears can be greatly allayed if the policy of the firm is to take back employees when they have recovered. The dread of the sanatorium can usually be overcome by education and wise propaganda.

The difficulty of returning to a different kind of work than that to which they have been accustomed must be faced by some workers. A man must know that his job is a real one and not one created merely to find him employment.

The employer's difficulties must be faced squarely. The returning tuberculous patient has usually a greatly reduced efficiency. He is inferior to the normal worker and this inferiority is likely to persist for a few years. If he attempts to keep pace with fellow workmen he invites early breakdown. Industry quite naturally is not likely to welcome the worker who needs a sheltered life if he is a new entrant, but most employers will take back old employees if the prospect of eventual return to reasonably good health exists. Of course, industry has to deal with many employees disabled by conditions other than tuberculosis. With these crocks the returning tuberculous worker has to compete for the suitable job. Many are the employer's problems in adapting the needs of industry to the employee who cannot be subjected to strains such as overtime work, shift and night work, and competition with more vigorous workers.

It is, of course, not possible to pay higher wages to the tuberculous patient than to other workers. In fact he must often be satisfied with a lesser wage. This means that at the very time he needs a higher and better standard of living, he actually has to be content with a much lower one. This situation calls for generous co-operation between the employer and the Care Committee (well organized in England). The tuberculous patient returning to industry should be subsidized until he is able to earn a reasonable wage. Industry cannot be expected to make the subsidy directly.

The danger of infecting other employees must also receive attention. A patient with a positive sputum should not be allowed to return to surroundings where he may infect others. Certainly he should not be permitted to engage in industry involving the handling or packing of food or which requires him to come into contact with the public.

The author urges close liaison between the tuberculosis service and industry. Small firms find it particularly difficult to deal with recovered tuberculous patients but can do much if the facts about tuberculosis are carefully explained to them by the medical officer or doctor. The doctor must not only be conversant with the disease but must also possess an intimate knowledge of the industry and requirements of the workers if he is to talk reasonably and convincingly with the management.

DIFFICULTIES OF THE SUPERINTENDENT OF A MENTAL HOSPITAL

According to Cormac (*Tubercle* 19:107-113, 1937), the records of Parkside Mental Hospital show that in the

past 30 years, 340 deaths occurred in which tuberculosis was a factor. Of these, 80 per cent were sufferers from some form of dementia or a depressed state, or were imbeciles or idiots. Patients suffering from these forms of mental disorder are usually incapable of complaining of feeling ill. They are lethargic and disinclined to take exercise, indifferent to food and of degraded habits. Respiration is shallow and infrequent and circulation is poor.

The diagnosis at an early stage is not easy as the usual physical signs are not apparent. It is necessary, therefore, to record the weight weekly, to take the temperature daily, to examine regularly the feces for the presence of tubercle bacilli and to use the x-ray when indicated.

The pressure of economy weighing on public institutions leads to difficulties of providing segregation, overcrowding, poor dietary, absence of laboratory facilities, inadequate milk supply and an insufficiently trained nursing staff.

These and other difficulties, common to most mental hospitals, have been largely overcome at Parkside Mental Hospital since the appointment of the present medical superintendent in 1914. The ratio of deaths from tuberculosis at Parkside compared with (English) county and borough mental hospitals has been decidedly lowered. In 1935, for example, this ratio for Parkside was 15 deaths from tuberculosis per 1000 patients in residence as against 46 in all other hospitals.

DIFFICULTIES OF THE GENERAL PRACTITIONER

According to Jackson (*Tubercle* 19 114 117, 1937), to persuade people, especially young people, to submit to observation and treatment during what might be called the "antenatal" stage of the disease in which no certain diagnosis can be made in the face of the doctor's suspicion, is a problem of the general practitioner. The chief reasons for the reluctance of patients to seek medical aid include

- 1 The temporary improvement in their general health following treatment which lulls both the patient and the doctor into a false sense of security.
- 2 Prejudice against being regarded as a subject for notification. Patients fear the social stigma, segregation and threatened invasion of their homes by the authorities.
- 3 Alarm caused by the prospect of losing income. This is probably the greatest obstacle to continued observation. The vast majority of working-class people simply cannot afford to be ill and hesitate to seek an opinion which will run counter to their own inclinations.

Other difficulties include the isolation of the patient at home, the supervision of contacts, and the question of fitness for work. The doctor's greatest difficulties are the social environment and low standards of living of his patients. — (Reprinted from *Tuberculosis Abstracts* May, 1938.)

SYPHILIS CONTROL AND TUBERCULOSIS CONTROL HEALTH CONTEST

This year as a part of the City Health Conservation Contest conducted annually by the Chamber of Commerce of the United States in co-operation with the American Public Health Association awards are being made for the most effective community wide programs for syphilis and tuberculosis control.

The committee of health experts known as the Grading Committee recently announced the following winners in the Syphilis Control Contest

First award goes to Tacoma, Washington, with awards of merit going to Hartford, Connecticut, Newark, New Jersey, Louisville, Kentucky, and New Haven, Connecticut.

In the Tuberculosis Control Contest, the winner is Detroit, Michigan, with awards of merit going to Newton, Massachusetts, Hartford, Connecticut, and New Haven, Connecticut.

A few of the items considered by the committee were the comprehensiveness of case finding and follow up services in connection with tuberculosis and syphilis, the facilities provided for diagnostic and treatment purposes, the extent of group participation in programs of education and control.

NEW UNIT AT THE MASSACHUSETTS GENERAL HOSPITAL

The contract for the construction of the George Robert White Memorial Building at the Massachusetts General Hospital has recently been awarded. This new unit, which will cost \$2,500,000, will be located directly back of the automobile entrance on Fruit Street and will replace several obsolete buildings. It will stand thirteen stories high and is designed to conform architecturally with the other buildings of the hospital. About a year and a half will be required for its completion.

The lower five floors will be occupied by departments that serve all divisions of the hospital, and the upper floors will contain operating rooms and surgical wards. The Bulfinch Building will be remodeled to house all the medical patients and laboratories.

NOTES

The University of Oxford has conferred the degree of doctor of science on Dr. Harvey Cushing, Moseley Professor of Surgery (emeritus), Harvard University, and Sterling Professor of Neurology (emeritus), Yale University.

Dr. S. Burt Wolbach, Shattuck Professor of Pathological Anatomy, Harvard University, was elected a member of the National Academy of Sciences at its recent annual meeting.

Dr. Barbara Ring of the Ring Sanatorium and Hospital in Arlington was recently awarded the Order of Merit by the Chilean Government for furthering inter American friendship. The presentation took place at the Chilean Embassy at Washington, and was occasioned by Dr. Ring's play "O Higgins of Chile."

At the recent annual meeting of the American Association in Mental Deficiency, held in Richmond, Virginia, Dr. Neil A. Dayton, director of the Division of Mental Deficiency and of the Division of Statistics and Research, Massachusetts Department of Mental Diseases, was elected president.

Middlesex University has recently announced the following full time appointments to the faculty of its School of Medicine: Dr. David L. Davidson, Sc.B. in Chemistry (summa cum laude), Sc.M., and Ph.D. in Biology, Brown University, to the Department of Biochemistry; Dr. Nathan R. Brewer, B.S., D.V.M., Michigan State, Ph.D. in Physiology, University of Chicago, to the Department of Physiology; and Dr. Rainer Zangerl, Ph.D., University of Zurich, to the Department of Histology.

CORRESPONDENCE

A CORRECTION

To the Editor I request that the *New England Journal of Medicine* correct the statement which appeared in the issue of May 5, to the effect that I stressed the need for more free and part pay evening clinics at the annual meeting of the Hospital Council of Boston on April 26 1938, by publishing in full the following statement made at that meeting in regard to this matter

Evening Clinics At the request of the Boston Council of Social Agencies, the Executive Committee of the Hospital Council appointed a committee to determine whether evening clinics beyond those now existing were needed in Boston. The committee sent a letter to forty four health and social agencies and twenty three hospitals, asking whether, in their opinion, people were deprived of adequate medical care because of lack of free or part pay evening clinics and whether in their opinion people were paying full evening clinic rates who ought to have the service free or at part cost rather than at full rates. Fifteen replied there was no need for further facilities, four were uncertain and fifteen felt there was need for further evening clinics. The committee, in reviewing the replies, felt that the majority of the group questioned was of the opinion that more evening service was needed, although actual supporting data are rather meager.

The Boston Dispensary reported the Monday and Friday evening clinics were being crowded and it was considering re-opening Wednesday evening. The Massachusetts Memorial Hospitals felt that their clinic was too crowded and were contemplating a second evening. These clinics were opened later.

The Committee to Study the Need for Evening Clinics, therefore, recommended that, if these two additional services were established, consideration of the extension of further evening clinic facilities be deferred until it is determined whether this extension is sufficient. The committee also recommended that if this extension of the existing evening facilities proves inadequate for the demand of free and part pay evening clinic service, the advice of the Massachusetts Medical Society be sought before further evening clinics are established under the auspices of the Community Federation of Boston.

JOSEPH B. HOWLAND, M.D., *President*
Hospital Council of Boston

80 Federal Street,
Boston, Massachusetts

STILL AMONG THE LIVING

To the Editor We wish to make correction of a gross error in our *Year Book* in commemoration of the Diamond Jubilee of the Carney Hospital, in which the name of Dr. Dana W. Drury is erroneously listed among A Quarter of a Century's Toll.

SISTER MARIE, *Superintendent*
Carney Hospital Corporation

Carney Hospital,
Boston, Massachusetts

NOTICES

MASSACHUSETTS SOCIETY
OF EXAMINING PHYSICIANS

The annual meeting and election of officers of the Massachusetts Society of Examining Physicians will be held at the Cooley Plaza Hotel, Wednesday, May 25, at 6 30 p. m. Dinner will be \$2.50 per plate.

PROGRAM

Trauma of the Knee Joint. Dr. Edwin F. Cave.
Expert Medical Testimony

As Viewed from the Bench

Hon. Abraham E. Pinanski, Justice Massachusetts Superior Court.

Hon. Wilford D. Gray, Justice Massachusetts Superior Court.

Hon. James C. Donnelley, Justice Massachusetts Superior Court.

Hon. George C. Sweeney, Justice U. S. District Court.

As Viewed from the Bar

James M. Hoy, Esq., Suffolk County

James W. Sullivan, Esq., Essex County

FRANCIS R. MAHONY, M.D., *President*

WILLIAM PEARCE COVES, M.D., *Secretary*

CAMBRIDGE HOSPITAL

The regular clinicopathological meeting of the staff of the Cambridge Hospital will be held at the hospital, 330 Mt. Auburn Street, Cambridge, on Tuesday, May 24.

All members of the medical profession are cordially invited to attend.

JOSEPH M. WADDEN, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING
MONDAY, MAY 23

TUESDAY, MAY 24

*9 10 a. m. Boston Dispensary Clinicopathological conference. Dr. Richard C. Wadsworth and Dr. Clark W. Heath.

10 a. m. 12 30 p. m. Tumor clinic Boston Dispensary

10 30 a. m. Massachusetts General Hospital Cardiac rounds

WEDNESDAY, MAY 25

8 a. m. Massachusetts General Hospital Grand rounds Orthopedic Department.

9 10 a. m. Boston Dispensary Hospital case presentation Dr. S. J. Thannhauser

*12 m. Clinicopathological conference. Children's Hospital amphitheater

6 30 p. m. Massachusetts Society of Examining Physicians Cooley Plaza Hotel

THURSDAY, MAY 26

9 a. m. Massachusetts General Hospital Surgical grand rounds

9 10 a. m. Boston Dispensary X-ray demonstration Dr. Alice Ettinger

9 15 a. m. Massachusetts General Hospital Neurological conference Ether Dome

12 m. Massachusetts General Hospital Clinicopathological conference

FRIDAY, MAY 27

*9 10 a. m. Boston Dispensary Pulmonary Carcinoma Dr. Donald S. King

10 a. m. Massachusetts General Hospital Fracture rounds

10 a. m. 12 30 p. m. Tumor clinic Boston Dispensary

12 m. Clinical meeting of the Children's Medical Service Massachusetts General Hospital Ether Dome

SATURDAY MAY 28

- *9 10 a m Boston Dispensary Lipoid Diseases Dr Thanhauser
 *10 a m 12 m Staff rounds at the Peter Bent Brigham Hospital
 Conducted by Dr Henry A Christian
 *Open to the medical profession

- MAY 19—New England Pathological Society Page 826 issue of May 12
 MAY 19—Boston Society of Psychiatry and Neurology Page 826 issue of May 12
 MAY 21—Boston City Hospital Symposium on Traumatic Surgery Page 825 issue of May 12
 MAY 24—Cambridge Hospital Page 865
 MAY 25—Massachusetts Society of Examining Physicians Page 865
 MAY 31—Tufts Medical Alumni Luncheon Page 858
 MAY 31—Harvard Medical Alumni Association Page 858
 MAY 31—The New England Regional Committee on Fractures of the American College of Surgeons Page 858
 MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston
 JUNE 1—Massachusetts Medico-Legal Society Page 858
 JUNE 1—New England Alumni Baltimore Medical College, College of Physicians and Surgeons University of Maryland Medical School Page 858
 JUNE 1 and 2—National Society for the Advancement of Gastroenterology Page 746 issue of April 28
 JUNE 6 7 8 and 9—American Association of Industrial Physicians Page 499 issue of March 17
 JUNE 10 and 11—American Heart Association Page 707 issue of April 21
 JUNE 13 17—American Medical Association San Francisco
 JUNE 13 OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 282 issue of February 10
 JUNE 23—Pentucket Association of Physicians Hotel Bartlett 95 Main Street Haverhill 8 30 p m
 SEPTEMBER 12 14—American Association for the Study of Gout Page 545 issue of March 24
 OCTOBER 17 21—Clinical Congress of the American College of Surgeons New York City
 OCTOBER 24 26—Academy of Physical Medicine Scientific Session Washington D C

DISTRICT MEDICAL SOCIETIES

HAMPDEN

Meeting will be held on the fourth Tuesday in July

PLYMOUTH

Meeting will be held at 11 a m on July 21

BOOK REVIEWS

Apoplexies Viscérales Sereuses et Hemorragiques (Infarctus Visceraux) Raymond Gregoire et Roger Couvellaire. 178 pp Paris Masson et Cie, 1937 50 Fr fr

This is a well-organized book in which the authors present experimental and clinical data to support their concept that so-called visceral apoplexy results from anaphylactic shock. They distinguish apoplexy from infarction, in that infarction involves a gross lesion of the vessels, whereas apoplexy does not. Infarction causes the death of a part, whereas apoplexy does not necessarily do so.

The authors emphasize that such apparently diverse conditions as hemorrhagic pancreatitis, so-called intestinal infarction without a gross vascular lesion, so-called thrombosis of the uterus and tubes, thrombosis of the testicles, pulmonary apoplexy and cerebral hemorrhage have certain characteristics common to all. They occur suddenly and the most striking general symptom is the precipitate fall in arterial tension. Certain characteristic changes occur in the various organs involved, and the authors believe that the individual variations depend upon the anatomy and function of the particular organ which is attacked.

They believe that they have been able to reproduce the general and local characteristics of the above mentioned conditions in experimental animals. Briefly, their experimental work has consisted of producing anaphylactic shock in such animals as the dog, rabbit and guinea pig

By sensitizing an organ to a foreign protein and later producing a generalized shock, they were able to reproduce the picture of hemorrhagic pancreatitis and the so-called infarction or thrombosis of either the intestine, uterus, testicles or lung. They discuss the mechanism of anaphylactic and anaphylactoid reactions and emphasize that it is a disturbance of the endothelium of the vessels, or more accurately, the result of a stimulation of the vegetative nervous system which runs in the endothelium. There is a vasodilation of the capillaries and venules severe enough to arrest or stop the flow of blood.

Surgery cannot be of much use in treating such a condition, and therapy should be directed toward limiting the general shock manifestations and combating the vasodilation existing in the involved organ. A general anesthetic is useful in decreasing a generalized disturbance of the vegetative nervous system, and the benefit which surgery seems to give to some of these cases may come from the anesthetic. Drugs such as adrenalin may be used in an attempt to overcome the local vasodilation.

The subject matter in this book is well arranged. The authors give their experimental results in considerable detail. Anyone interested in this subject should read the book.

The Laboratory Diagnosis of Syphilis The theory, technique and clinical interpretation of the Wassermann and flocculation tests with serum and spinal fluid Harry Eagle 440 pp St. Louis The C V Mosby Company, 1937 \$5.00

The author takes up in great detail in the first eight chapters the Wassermann test in its various steps from a laboratory technician's point of view. In the next four chapters he deals with the various flocculation tests from the same point of view. There are two chapters on procedures with spinal fluids and one on tests other than Wassermann or flocculation tests.

For the clinician, the successive chapters discuss the clinical evaluation and the statistical comparison of these various tests.

This book should be of great value both to the laboratory worker and the clinician and should be in a library and wherever tests are being made or syphilis is being treated. The bibliography is exhaustive.

Theoretical Principles of Roentgen Therapy Edited by Ernst A. Pohle. 271 pp Philadelphia Lea & Febiger, 1938 \$4.50

As the name implies, this volume is devoted chiefly to the physics of roentgen rays. In addition, there are some remarks on the biologic effects of radiation.

The first chapter is contributed by K. W. Stenstrom, Ph.D., it deals briefly with nuclear physics and the production, characteristics and measurement of roentgen rays. The second is by Dr. R. R. Newell, and is devoted to a description of various types of x-ray apparatus. The third, by L. S. Taylor, Ph.D., and Dr. E. A. Pohle, deals with practical dosimetry. Dr. F. C. Wood has contributed the fourth chapter, which concerns radiobiology and radiopathology. Dr. L. S. Taylor concludes the volume with a consideration of protection from roentgen rays.

The book is interestingly written and is designed for the radiotherapist who desires a thorough understanding of the theoretical principles underlying roentgen ray therapy. The need for such a work has long been felt and has been admirably met.

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THE GROWTH OF THE BOSTON CITY HOSPITAL FROM 1864 TO THE PRESENT

MERRILL MOORE, M.D. *

BOSTON

SEVENTY-FOUR years ago the citizens of Boston started something new in community ventures. They built a public hospital, "designed in the words of the first annual report of its trustees, "to do the greatest possible good to the greatest possible number."

The traditional span of a man's life having passed it seems timely to try to analyze and suggest, on a statistical basis, how well the Boston City Hospital has succeeded in living up to the high purposes and hopes of its founders.

Because figures are notoriously cold, it is impossible by the geometry of a statistical curve to estimate pain allayed and suffering made supportable. But a little thought will enable any mind to penetrate through the impersonal figures recorded here and to perceive the human values they represent. In the gradual but steady expansion and improvement of the Boston City Hospital eloquent proof is offered that the founders' aim, while always falling short of perfect fulfillment, is still the activating ideal of the hospital and the inspiration of its staff.

From the present complicated institution with its multiplicity of departments and services and clinics and offices, it seems a far cry back to the unpretentious beginnings of 1864. Yet in these years the hospital has treated more than a million patients. The demand for its services has grown so much that while Boston ranks ninth in population in the United States, the Boston City Hospital ranks sixth in size and fourth in the number of patients treated. From 1864 to the present, while the population of the city has increased four and a half times, the hospital admissions have increased over forty times (Chart 1). And since the average daily number of patients has skyrocketed the absolute number of deaths has naturally in-

creased, although the relative mortality has been definitely lowered.

Reproducing as it does in miniature the growth of the nation at large, the story of the Boston City Hospital has been one of rapid expansion and sensitive adjustment to the needs of those it serves. The hospital was dedicated on May 24, 1864, with special exercises attended by all members of the municipal government. Before its doors were thrown open to the public on June 1 final ceremonial inspection was made by Admiral Lesofsky and the officers of the Russian fleet, which was then lying in Boston Harbor.

From the very beginning, the new institution took upon itself responsibilities and obligations which might well have severely taxed a more mature enterprise. During its first full year of operation, 1865, it cared for 1066 patients, 18 of whom gave their occupation as "gentleman." After running five years it was caring for 3054 patients yearly. In 1934, after seventy years of service, more than 43,000 cases were cared for on its wards. More recent years report correspondingly large numbers.

During the first year of complete operation the daily average number of patients was 114. By 1897 this average had increased to 463. In 1932 it was 2155. In 1870, the first year for which accurate figures are available, patients stayed in the hospital on an average of 27 days. Fifteen years after its opening the average number of days' stay at the Main Hospital was 22. At the present time this has been lowered to 11.

Nevertheless, multiplicity of function alone, or mere numerical increase in the number of patients treated, is not a true index of an institution's real development. Progress on paper can often be achieved by a lowering of the standards of service or by a retreat from hard-won levels of efficiency. Thus, while there is no difficulty in showing, by means of a simple chart, the numerical growth of the Boston City Hospital, the true significance

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of the data lies in their demonstration of the increased effectiveness of the hospital, paralleling its growth in numbers

This development can be clearly indicated by fully considering the growth of the hospital as indicated by the increase in the daily average number of patients cared for and in the total number

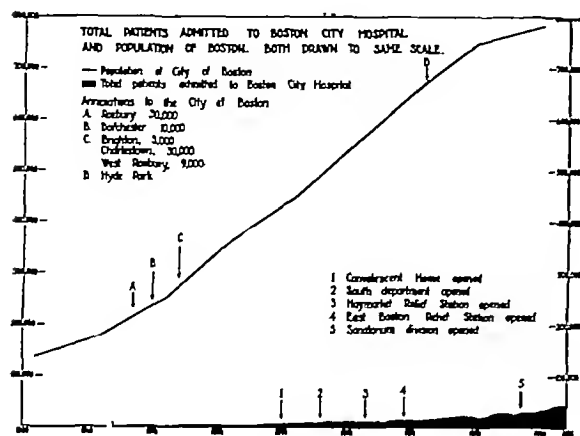


Chart 1

of days' stay of all patients, taken in connection with the reduction in the average number of days' stay and in the mortality rate

First to be considered are the data which describe so vividly the numerical growth of the hospital. As has been stated, during 1865, the first full year of operation, 1066 patients were treated. During 1933 the hospital cared for 43,064 patients—equal to nearly one half the present population of Nevada and forty times as many patients as were treated in its first year.

Examples may be reported, taken at ten-year intervals, of the number of patients the hospital has cared for

YEAR	NO. OF PATIENTS
1870	3,054
1880	3,995
1890	6,510
1900	11,167
1910	12,970
1920	19,475
1930	32,968
1933	43,064

From these figures it is seen that during the first thirty years the growth in the number of patients admitted was gradual and proceeded at an even rate. From 1900 to 1920 this growth was accelerated. Since 1925 there has been a strikingly disproportionate increase, represented by nearly 2000 additional patients per year. The following table shows the average annual increase in admissions by fifteen-year periods

PERIOD	AVERAGE INCREASE
1865-1880	217
1880-1895	293
1895-1910	329
1910-1925	914
1925-1933	1962

On considering these figures, one is immediately struck with the difference between the growth of the Boston City Hospital and that of other public institutions—the Boston Psychopathic Hospital, for example. The latter has a settled policy of admitting about 2000 patients each year. As a result its rate of growth has remained practically stationary (and at full capacity) for two decades.

An examination of Chart 2 reveals the growth in the number of patients admitted to the Main Hospital alone and to the South Department—the department of contagious diseases—alone, as well as the total of their combined numbers. As is the case with the number of patients admitted to all departments, the growth in the Main Hospital during the first thirty years was gradual.

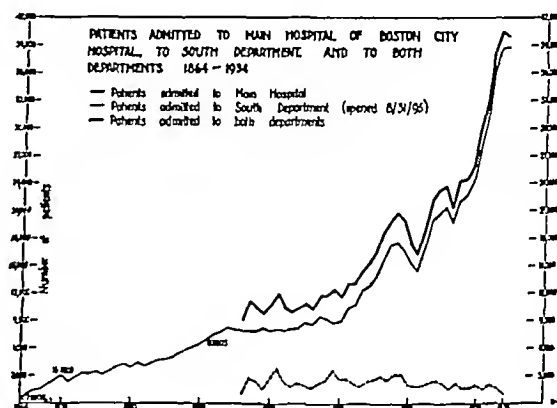


Chart 2

The next twenty years witnessed a more rapid inflow, while since 1920 the rate of growth in numbers has been unusually large. It is interesting to note that the South Department is today admitting fewer patients than at any time in its history. This fact may be taken as evidence of the great advances that have been made in the study of infectious diseases and the increased effectiveness of the Departments of Sanitation and Public Health in the city. As public education in the control of preventable diseases becomes more widespread, and as these departments achieve a more complete public co-operation, a continued drop in the admission rate to the South Department may be expected. The South Department, though still invaluable for isolation purposes, no longer fills the need, quaintly yet persistently presented by the superintendent and trustees in the first annual report.

We would call the attention of the City Council to the subject of the speedy erection of a building of moderate dimensions, to be used as a Foul Ward. There are at almost all times in such a hospital, cases of delirium, or patients affected with loathsome diseases, requiring separation for their own proper treatment, as well as for the safety and comfort of others.

To gain an idea of the relative number of patients handled in the different departments of the hospital, the following table is made up for the representative year 1931

	NUMBER OF PATIENTS	PERCENTAGE OF TOTAL PATIENTS
Main Hospital	30,921	86.0
Sanatorium Division	478	1.5
South Department	1,639	4.5
East Boston Relief Station	223	1.0
Haymarket Square Relief Station	2,237	6.0
Convalescent Home	305	1.0

The question naturally arises, What are the causes for this amazing hospital growth? Since the expansion of any public institution is only a function of the needs which it supplies and of the confidence which it inspires, the immediate answer to this question lies in the rapidly increasing public dependence upon tax-supported medical service, and a growing confidence in its competency which was formerly more quickly granted to private hos-

widespread. These are questions that need further study from every angle,—economic, sociologic and governmental,—and from the point of view of public relations. In connection with these questions, the following facts may be considered.

In the Out-Patient Department of the Boston City Hospital during the months of November and December, 1937, 5508 patients were interviewed by social workers before being admitted for treatment. Of these, 146 were steered elsewhere because they were not residents of Boston, 2312 were receiving definite aid in one form or another. On analyzing the incomes, it was found that 1166 patients had incomes under \$1000 a year, 951 had incomes of between \$1000 and \$1500, and 321 each received \$1500 or over. One thousand five hundred and five patients, or a little over 25 per cent, volunteered the information that they would be willing to pay an admission fee to the Out-Patient Department of from ten to twenty-five cents. Approximately 51 per cent of those applying for admission fell into the aided class (plus pensioners and city employees). Of the remaining 2882 patients, 2117 had incomes so low that taking into consideration the size of the family, the probable length of medical treatment, and other factors, they were unquestionably eligible for outpatient care. The percentage of patients on relief dropped 8 or 9 per cent from the previous year, but the salaries received by the unaided patients still were so close to the borderline that, with past debts (in some cases) to pay off, they were obviously eligible for care in the clinics.

Other factors have of course entered intimately into the growth of the Boston City Hospital. With advancing knowledge of medicine, the successful treatment of disease has come to depend more and more on skillful nursing and on a number of mechanical and chemical accessories not available in private homes. Since city treasuries are popularly supposed to be inexhaustible, the public easily assumes that a municipally supported hospital has the best equipment and the most complete resources. And when life or health is at stake most people are willing to endure the incidental discomforts of a public hospital if they can feel assured of good treatment.

Roughly speaking, the era of greatest initial development of the hospital coincides with other important social manifestations. One of these was the unrestricted immigration tide to America from Europe, that is said to have reached two peaks prior to 1900. As these newcomers became gradually adjusted to their new environment, they developed, in classes and groups, a wide appreciation of the treasures available to them in the various public institutions—schools, hospitals and clinics.

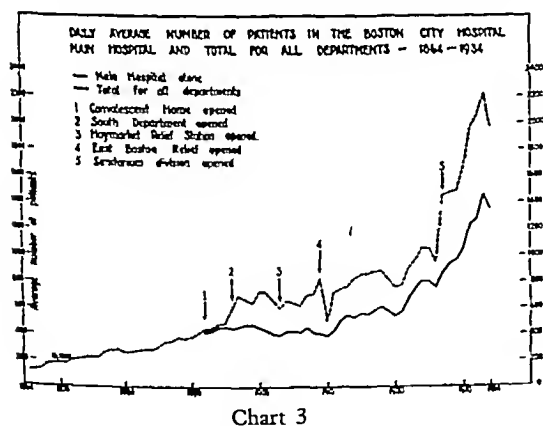


Chart 3

pitals and private practitioners. Originally this dependence was more restricted to the poorer classes, but recently the economic depression has forced it upon the middle class—the white-collar group—and having tasted the apple, they find it surprisingly good. In a day when state-supported medicine is a hotly debated question, the enormous recent growth of the Boston City Hospital is a portent worthy of note.

One may well wonder what social trends are responsible for this growth. Is it due to the disproportion between the mounting cost of medical care and the constantly low yearly income of the majority of families served by this hospital? Illness is apparently not increasing, and public education on the use of hospitals is obviously becoming more

With this enlarged view came an increased use of, and dependence on, these facilities. Just as it was not the native, indigenous stock which contributed most to the material development of metropolitan districts, neither was it the same stock which caused the noteworthy leap in hospital admissions.

The following facts, of special pertinence to the questions mentioned above, should be emphasized (Chart 1)

1 From 1860 to 1900 the population of Boston increased threefold. The growth in the number of patients admitted to the Boston City Hospital was roughly proportionate.

2 Since 1900, while the population of Boston has increased only 14 times, the number of patients admitted to the hospital has increased 4 times.

3 In the last ten years the patients admitted to the hospital have increased by more than 25 per cent over what constituted normal average admissions prior to this period.

These observations may be interpreted as indicating that hospital facilities, whatever be the cause of the growth, have at least adjusted themselves very sensitively to the needs and demands

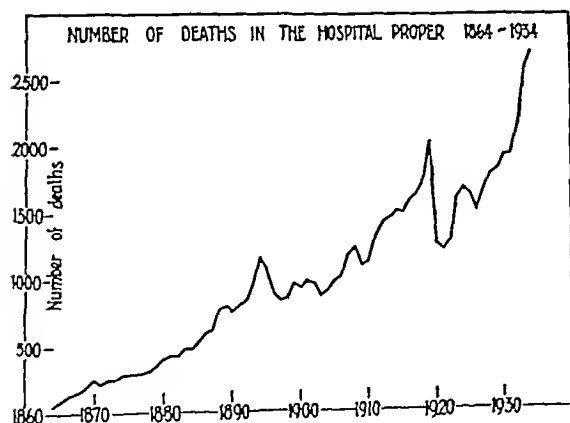


Chart 4

of the city and at a rate far in advance of the rate of growth of the city's population.

The changes which have taken place in the average number of days' stay in the hospital are in part due to the process of specialization in the treatment of patients as it occurs in modern hospital practice. The contagious cases are handled by the South Department. The Convalescent Home* took care of patients not yet able to return to their work. The Sanatorium Division provides only for tuberculosis cases. This division of function leaves the Main Hospital free for surgical and medical cases where isolation is not required. As a result, the average length of stay

The Convalescent Home has not been open for the last few years.

in the Main Hospital has decreased from 27 days in 1871 to 11 days at the present time. At the Convalescent Home the length of stay decreased from 20 days in 1895 to 15 days in 1930. The length of stay in the Sanatorium Division, averaging as it does 6 months, naturally increases the hospital average when all departments are taken together. This department was opened in 1927 and in 1933 the length of stay averaged 198 days. In the South Department the length of stay has increased slightly from 30 days in 1900 to 32 days at the present time. Since 1905 the average stay at the Haymarket Square Relief Station has decreased from 2.3 days to 1.5 days. At the East Boston Relief Station there has been a decrease from 3.8 days in 1910 to 2 days.

As evidence of the increased effectiveness of the hospital, the lowered mortality rate is noteworthy. Death most frequently occurs in the hospital when

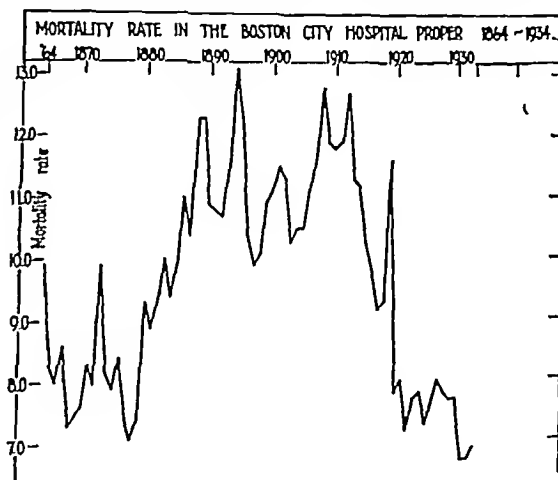
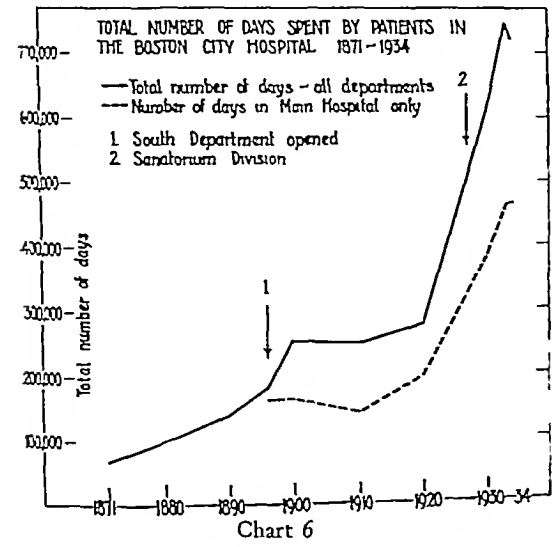


Chart 5

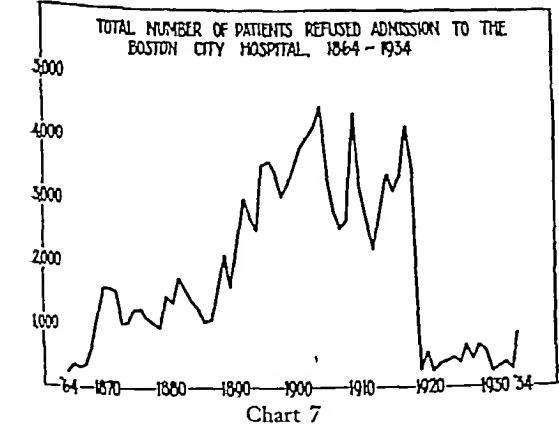
patients have been brought there in a dying condition—either as a result of severe accident or because of acute attacks of serious illness. Chart 4 shows the number of deaths in the hospital proper from 1864 to 1934. There was a gradual and even rise in number until 1892, and a considerable rise in 1894. There was a subsequent gradual rise until 1919, then a sharp increase occurred, due to epidemic influenza. From 1920 to 1922 there was a decrease in number, but since 1922 there has been a rapid increase. In the year 1932 the number of deaths totaled 2700. Nevertheless, despite this rise in the absolute number of deaths the mortality rate for the hospital proper has declined (Chart 5). Since 1864 the Boston City Hospital's death rate has varied from 67 to 131 per cent of total admissions. From 1894 to 1919 it averaged about 115 per cent. In 1920 it fell off to 79 per cent and has remained below 80 per cent since then.

For the last few years the rate has been below 7 per cent

Ranking today as the greatest hospital—in size and physical equipment—in one of the most im-



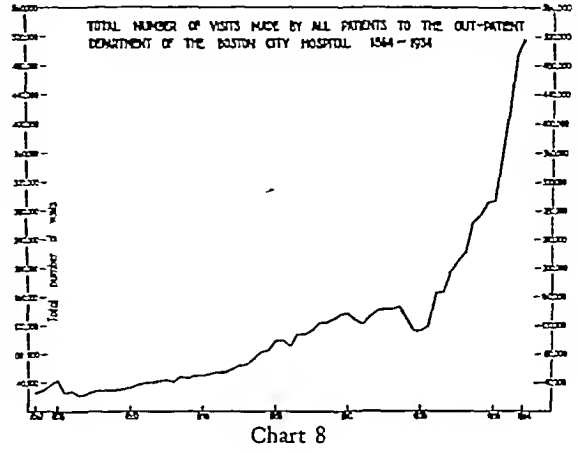
portant medical centers of this country, the Boston City Hospital is entitled to considerable praise for its honorable record of achievement in the past seventy-four years. It started very unpretentiously, and few would have imagined that in its development it would proportionately far outstrip the city it serves. The elasticity of its response and the sensitivity of its reaction to public need have now for many years been a revelation of the high seri-



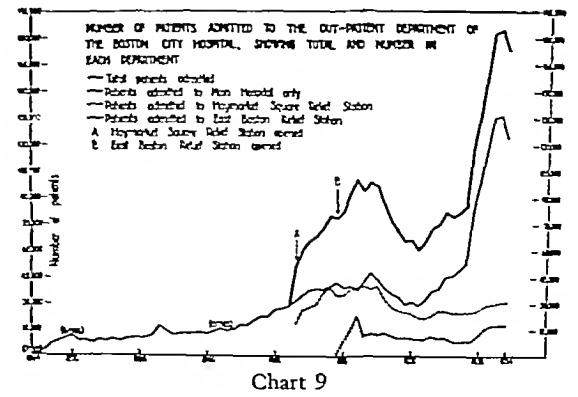
ousness with which the officials and staff have chosen to regard their task

In the period of its first seventy years the hospital has treated 1,015,793 patients. Its original staff of a dozen men has grown until it now numbers nearly three hundred physicians on whom falls the daily burden of caring for the two thousand patients who are under its roof every day. As needs have arisen new services have been initiated, new

equipment has been installed, and safer and more efficient buildings have been erected. Happily too, the hospital's scientific spirit has developed step by step with its rise to physical eminence. Today it attracts physicians and students from every part of the world and, with a commendable lack of provincialism, counts graduates from every leading medical school in America as members and alumni of its staff.



All this has not been brought about by magic, though the sustained effectiveness with which it has happened at times has suggested magic. It has occurred by labor and through a system, by an ordered and natural way, starting first with human needs expressed in community life by conditions requiring special attention. The hospital was then founded, an organization and a plan were created and followed. The Boston City Hospital is, and has been from its beginning, a co-operative undertaking between citizen and taxpayer, councilor and mayor,



superintendent, trustees, medical, surgical, nursing and social-service staffs, hospital personnel and patients

In addition to the recognition naturally due the staff members many of whom have spent the bet-

ter part of their lives in free attendance, and the credit due the nursing personnel, whose wages do not in any way repay the services it gives, special appreciation is due the two groups of men who have most directly shaped and controlled the hospital's course they are the superintendents and the trustees of the past and present. These men have felt most keenly the responsibility they have shared, and in passing they deserve the most signal recognition for what they have done to make the hospital what it is.

Physicians and surgeons who have grown old in the service of suffering humanity insist that, in ministering to sick people, no slightest help that can be given them is without value or without benefit. Good nurses know that there can be healing in the

smoothing of a pillow and charity in the combing of a patient's hair. So it is when one thinks of seventy-four years and more than a million sick people one can catch some glimpse of all that this hospital has meant in terms of pain allayed, of suffering made endurable, and of men and women healed and made well again and restored to those who love them.

Suffering humanity is always appealing humanity. That is why the best title which the Boston City Hospital has won in all these years is that it has always been instant to answer the call of those who needed help, and unimaginably generous of itself and the service it is able to provide.

384 Commonwealth Avenue.

ASCORBIC ACID REQUIREMENTS IN EARLY INFANCY

THEODORE H. INGALLS, M.D.*

BOSTON

THE Health Committee of the League of Nations has recently set forth in its report¹ that "vitamin C should be given as from the age of three months," and that "the quantity given to children should correspond to a daily dose of not less than 5 mg. of ascorbic acid."

In the past we have had to rely on trial-and-error methods to ascertain the age level at which vitamin C should be added to the diet of artificially-fed infants, and likewise the time when the need arises in infants at the breast. Nor have we ever had a clear conception of the amount of antiscorbutic substance needed to prevent vitamin C deficiency. By the administration of pure ascorbic acid and the use of the indophenol titration method for assaying the concentration of ascorbic acid in urine, milk, tissues and plasma, these questions can now be answered with a certain degree of accuracy.

Good reasons exist for questioning the validity of both the statements just quoted that vitamin C should be given as from the age of three months, and that 5 mg. is an adequate daily dose. In the first place we know that clinical scurvy can develop before the age of three months. Thus, Jackson and Park² have reported the earliest case on record in an infant who died at twenty days, and Hagmann³ has cited a case of florid clinical scurvy in a child of three months who had had no orange juice the first two months of life, after which it was started in teaspoonful amounts.

That scurvy can occur before three months is also evidenced by an analysis of the necropsy protocols of 3 premature infants, whom we had the opportunity to observe. These patients were admitted within the first three days of life, and all suffered from acute infections of the upper respiratory tract. They died at the ages of fifty-seven, twenty-six and thirty-two days, respectively. During life these infants were maintained solely on

Table 1. *Liver-Reducing Power Expressed as Ascorbic Acid, According to Age Grouping (38 cases)*

AT BIRTH (8 cases)	BIRTH TO 1 MONTH (17 cases)	1 TO 4 MONTHS (13 cases)
mg. per 100 gm.	mg. per 100 gm.	mg. per 100 gm.
20	7	3
23	10	4
25	11	5
27	13	5
29	16	7
53	18	9
56	20	11
75	26	13
—	28	16
Avg. 38.5	30	16
	32	16
	33	18
	38	29
	43	—
	46	Avg. 10.8
	51	
	58	
	—	
	Avg. 28.2	

pooled, pasteurized human milk, a food which, as we shall demonstrate later, is grossly deficient in ascorbic acid. In each, definite evidences of scurvy were found histologically, although no clinical signs of the disease were observed (Figs. 1-4).

These findings are complemented by the data presented in Table 1 on 38 infants coming to autopsy before the fourth month of life. Twenty-five of these babies died either at birth or before

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the age of one month, in only 1 case was the reducing value of liver tissue less than 10 mg per 100 gm of tissue. Of 13 infants dying between the ages of one and four months, however, no less than 7 showed such a low value.

Although the data obtained by the assay of liver tissue, as well as that of urine and food, contribute much to our information regarding vitamin C deficiency, they must, as yet, be considered as somewhat qualitative rather than precisely quantitative. Further studies must be made before we can state positively to how great an extent the reducing substances in such specimens are actually representative of ascorbic acid. Nevertheless, the concentrations obtained in this relatively large number of infants tend to show that in the early months of life the storage in the tissues in existing circumstances may be comparatively low.

There are other data which also indicate that it is unwise to delay the addition of the vitamin C supplement until the age of three months.

Studies on adults,⁴ as well as on infants² between the ages of four and twenty-four months, have shown that the capacity of the tissues to store vitamin C is limited to so-called saturation. At this stage ascorbic acid supplied in excess of the daily requirement is largely excreted in the urine. Even a saturated individual when placed on a scorbutic dietary for three months exhausts his tissue depots by a combination of excretory and metabolic processes. These observations undoubtedly can be extended to newborn infants.

Although the development of clinical scurvy constitutes no serious threat in the ordinary course of events, and is an insidious process requiring considerable time to become manifest, it does not seem the part of wisdom to exhaust existing depots for one, two or three months before administering adequate daily doses.

We are, therefore, led to the conclusion that the daily ascorbic acid supplement should be added to the infant's dietary early in the neonatal period—for instance, in the first week of life. This seems especially important for premature infants, for the artificially fed and for those suffering from disease. Further studies are necessary before we can establish arbitrarily the requirements of the breast-fed infant. Such requirements obviously depend on variations of vitamin secretion in human milk.

Let us now consider the facts concerning the amount of ascorbic acid which would serve to protect the organism from developing vitamin C deficiency. It must be borne in mind that doses capable of preventing florid clinical scurvy may still be far below the optimum amount needed for perfect functioning of the organism. One approach to this problem lies in the quantitative

analysis of the ascorbic-acid content of cow's milk and mother's milk, since these substances comprise in the main the dietary of the newborn. In this regard it is necessary to ascertain the magnitude of vitamin content not alone in fresh milk, be it cow's milk or mother's milk, but especially in the substance just prior to consumption. As a result of numerous investigations,⁶⁻¹¹ the average vitamin C content of fresh mother's milk may be set at 0.4 mg per cubic centimeter, as shown in Table 2. The normal baby during the first three months of life in consuming from 500 to 1000 cc of breast milk per day will thus ingest the equivalent of 20 to 40 mg of vitamin C.

Table 2 *Average Vitamin C Content of Human Milk as Determined by Different Investigators*

	mg per cc
Wacholder ⁶	0.44
Kasahara et al	0.45
Stoer ⁷	0.50
de Haas et al ⁸	0.40
Selleg and King ¹⁰	0.55
Ingalls et al ¹¹	0.45
Average	0.43

Pasteurized cow's milk is a notoriously poor source of vitamin C. Over nine different days a random sampling of the milk supply of the Infants' Hospital revealed a vitamin C content too low to be determined, that is, less than 0.01 mg per cubic centimeter.

Except when the infant nurses at the breast, the situation is not a great deal better when mother's milk is utilized. Under marketing conditions, it has to be collected, pooled, pasteurized and disbursed, processes which facilitate the oxidation of ascorbic acid. Selleg and King¹⁰ noted the average loss in titration values for eleven samples of breast milk held in a refrigerator for eighteen hours to be 27 per cent.

Assay of pooled milk obtained from the Directory for Mother's Milk has revealed an average content of 0.26 mg per cubic centimeter.¹¹ After pasteurization and delivery to the ward, the value averaged 0.03 mg per cubic centimeter, or less than one tenth of the amount found in fresh mother's milk. Thus, it is improbable that any of the 3 infants included in this report received much more than 5 to 10 mg ascorbic acid per day from such milk. It is interesting to note that the vitamin C content of 500 to 1000 cc. of such milk approximates the fully prophylactic dose for a 300-gm guinea pig.

SUMMARY

1. Ascorbic acid nutrition is a relative term embracing several zones of vitamin depot between a protective saturation of the tissues and clinical scurvy. Scurvy can develop in infants as young as three months of age.

2 Judging from the known facts of ascorbic acid storage and utilization, it seems wisest to inaugurate the ascorbic acid supplement of artificially fed infants early in the neonatal period, rather than to defer it for several weeks.

3 Although data as to the exact daily dose desirable for small infants are meager, by inference from the amount present in breast milk and from clinical experience we may set the figure in the neighborhood of 20 to 30 mg of ascorbic acid a day, or its equivalent in 45 to 60 cc of orange juice.

CASE REPORTS

Case 1 K B., a premature female infant weighing 4 lb., 8 oz., was admitted to the hospital on the first day of life after a normal labor lasting 11 hours. The father

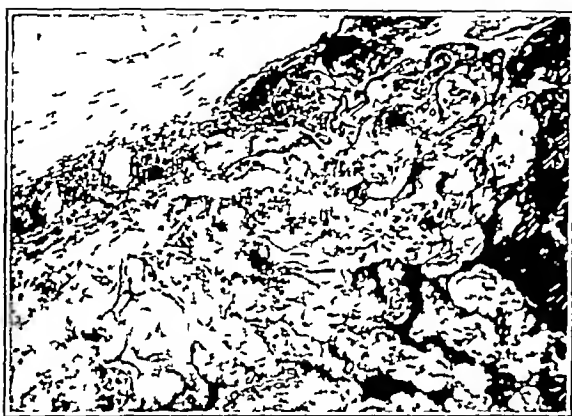


Figure 1 *Case 1* Low power photomicrograph of the costochondral junction showing abnormal persistence of dark-staining calcified cartilage columns, with interdigitating spicules forming a lattice. The remnant of previously formed bone shows up in lighter tone. There is cessation of osteoid deposition, atrophy of the hematopoietic substance and beginning overproliferation of stellate osteoblasts. Note the discontinuity of the cortex and several petechial extravasations of red blood cells just under the periosteum running diagonally across the upper left-hand corner of the photograph.

and mother and three siblings were dependent on welfare aid. The mother's health was good, her diet was without milk for the last 4 months of pregnancy and 'chiefly comprised hamburger and potatoes, with some vegetables, a little fruit and plenty of butter.

Examination revealed a small, well formed, premature infant with a husky cry and good color. The lungs showed slightly impaired resonance, and the breath sounds were heard poorly. There was a moderate systolic murmur. The spleen and liver were felt 1 cm. below the costal margins. The red-cell count was 5,110,000, and the hemoglobin 107 per cent. Spinal puncture revealed no cells in the spinal fluid.

The baby was starved for 12 hours and then started on 4 cc. of 5 per cent glucose, increased 4 cc. at a time every 4 hours until 25 cc. were given. Breast milk was slowly substituted, no cod liver oil or orange juice was given. The general condition remained good. In spite of an apparently good appetite and the absence of any

apparent infection, the infant did not gain weight. After a while she did not seem to see. The eyeballs became larger than normal, and a diffuse haziness of the cornea developed, after 4 or 5 weeks, evidence of pneumonia appeared, this slowly became more marked, vomiting occurred, and the child went steadily downhill and died on the 57th day of life.

From postmortem cultures of the heart's blood, right

AGE INTERVAL	DAILY FEEDING OF PASTEURIZED BREAST MILK	APPROXIMATE VITAMIN C CONTENT
	oz	mg
1st week	8.0	0.7
2nd week	11.0	1.0
3rd week	12.0	1.1
4th week	13.0	1.2
5th week	13.5	1.2
6th week	13.5	1.2
7th week	13.5	1.2
8th week	9.0	0.8

and left lung and left ear *Staphylococcus aureus* and *Bacillus coli* were isolated. There were hemorrhagic and bronchopneumonic infiltrations of the lungs. Sections of the costochondral junction revealed changes consistent with scurvy, as shown in Figure 1. No evidences of vitamin A deficiency were manifest.

Case 2 W T., a premature male infant weighing 2 lb., 8 oz., was admitted to the hospital on the 1st day of life after a "hard delivery." The father was unemployed, the mother was in good health and worked as a waitress. During pregnancy her diet consisted of orange juice, grapefruit, occasionally cereal, eggs two to three times a week, toast and tea, soup and crackers, occasionally a

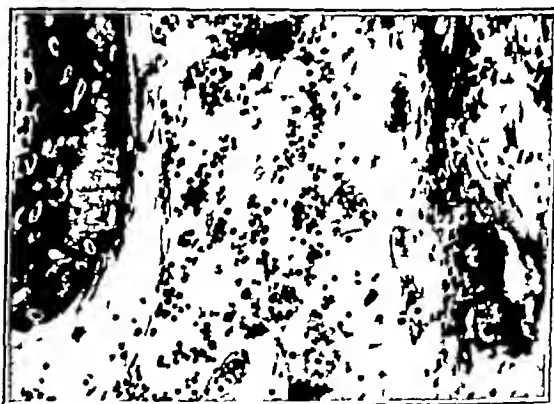


Figure 2 *Case 2* High power photomicrograph of the marrow substance near the costochondral junction showing atrophy of the hematopoietic substance and exposure of the loose textured reticulum.

meat, chicken or vegetable sandwich, and not much milk. The child was cyanotic and was resuscitated with difficulty. Examination revealed prematurity, molding of the skull and cyanosis. The case was otherwise not remarkable. The red-cell count was 4,300,000, and the hemoglobin 80 per cent. X rays of the long bones showed no abnormalities.

As the temperature was low, the baby was placed in an incubator. During the first 2 weeks of life he vomited bile stained material and lost weight. The stools were not remarkable, but the temperature was very unstable. The infant was transfused and given several cluses. He was fed by gavage, no cod liver oil or orange juice was given. On the 21st day a large stool was passed consist-

ing of mucus and blood. An exploratory laparotomy was done but no intussusception or obstruction was discovered. The baby went steadily downhill until death occurred on the 26th day of life.

AGE INTERVAL	DAILY FEEDING OF PASTEURIZED BREAST MILK	APPROXIMATE VITAMIN C CONTENT
	oz	mg
1st week	1.0	0.1
2nd week	4.0	0.4
3rd week	4.5	0.4
4th week	2.5	0.2

Autopsy showed marked emaciation. The lungs were atelectatic and aspirated material was present, together with evidence of acute interstitial bronchopneumonia. There was malrotation of the colon, with a common

the 5th week and he died, after many cyanotic spells relieved by oxygen, on the 32nd day of life.

AGE INTERVAL	DAILY FEEDING OF PASTEURIZED BREAST MILK	APPROXIMATE VITAMIN C CONTENT
	oz	mg
1st week	7.0	0.6
2nd week	9.0	0.8
3rd week	12.0	1.1
4th week	10.0	0.9
5th week (3 days)	8.0	0.6

At autopsy there was an acute bronchopneumonic process in the lungs with marked bronchitis and peri bronchitis. Other findings of interest included an ulcera-



Figure 3 Case 2 High power photomicrograph of a rib near the periosteum showing the fibrin like 'scurvitic' bone which stains a deep scarlet with eosin. Atrophy of the hematopoietic substance is also evident.



Figure 4 Case 3 High power photomicrograph of a region near the costochondral junction showing overproliferation and change in the morphology of the osteoblasts as contrasted with a portion of normal-appearing marrow substance on the right.

mesentery for both large and small bowel. An acute peritonitis with fibrinous adhesions was found. The histologic findings in the ribs were consistent with those of scurvy, as shown in Figures 2 and 3.

Case 3 J. B., a premature male infant weighing 4 lb 8 oz., was admitted to the hospital on the 3rd day of life after an easy labor in the home. The father and mother and two siblings were dependent on city aid. The mother's diet and health during pregnancy were reported as good. Examination was not remarkable except for prematurity and icterus of the skin and sclerae. The heart and lungs were normal. The red and white-cell counts and the hemoglobin were normal. The urine was normal except for the presence of bile. X rays of the long bones showed nothing remarkable.

The patient did moderately well during the first 3 weeks of life, with a fair gain in weight, but despite incubator care he ran a consistently low temperature. No cod-liver oil or orange juice was given. During the 4th week he showed evidence of upper respiratory infection with rapid extension to the lungs. Vomiting and refusal followed. He was given a transfusion but showed a poor reaction to it. His condition became much more worse in

tive esophagus and hemosiderosis of the spleen. The histologic findings in the ribs were consistent with scurvy, as shown in Figure 4.

I acknowledge my indebtedness to Dr. Kenneth D. Blackfan for his advice and helpful interest in this problem.

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2 Judging from the known facts of ascorbic acid storage and utilization, it seems wisest to inaugurate the ascorbic acid supplement of artificially fed infants early in the neonatal period, rather than to defer it for several weeks

3 Although data as to the exact daily dose desirable for small infants are meager, by inference from the amount present in breast milk and from clinical experience we may set the figure in the neighborhood of 20 to 30 mg of ascorbic acid a day, or its equivalent in 45 to 60 cc of orange juice

CASE REPORTS

Case 1 K B, a premature female infant weighing 4 lb, 8 oz., was admitted to the hospital on the first day of life after a normal labor lasting 11 hours. The father

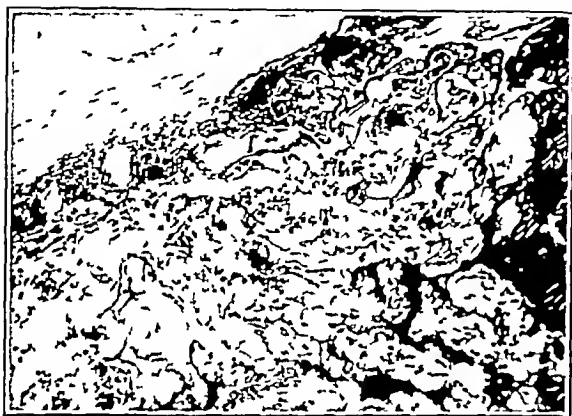


Figure 1 *Case 1* Low power photomicrograph of the costochondral junction showing abnormal persistence of dark staining calcified cartilage columns, with interdigitating spicules forming a lattice. The remnant of previously formed bone shows up in lighter tone. There is cessation of osteoid deposition, atrophy of the hematopoietic substance, and beginning overproliferation of stellate osteoblasts. Note the discontinuity of the cortex and several petechial extravasations of red blood cells just under the periosteum running diagonally across the upper left-hand corner of the photograph

and mother and three siblings were dependent on welfare aid. The mother's health was good, her diet was with out milk for the last 4 months of pregnancy and chiefly comprised hamburger and potatoes, with some vegetables, a little fruit and plenty of butter.

Examination revealed a small, well formed, premature infant with a husky cry and good color. The lungs showed slightly impaired resonance, and the breath sounds were heard poorly. There was a moderate systolic murmur. The spleen and liver were felt 1 cm below the costal margins. The red-cell count was 5,110,000, and the hemoglobin 107 per cent. Spinal puncture revealed no cells in the spinal fluid.

The baby was starved for 12 hours and then started on 4 cc. of 5 per cent glucose, increased 4 cc. at a time every 4 hours until 25 cc. were given. Breast milk was slowly substituted, no cod liver oil or orange juice was given. The general condition remained good. In spite of an apparently good appetite and the absence of any

apparent infection, the infant did not gain weight. After a while she did not seem to see. The eyeballs became larger than normal, and a diffuse haziness of the cornea developed, after 4 or 5 weeks, evidence of pneumonia appeared, this slowly became more marked, vomiting occurred, and the child went steadily downhill and died on the 57th day of life.

From postmortem cultures of the heart's blood, right

AGE INTERVAL	DAILY FEEDING OF PASTEURIZED BREAST MILK oz	APPROXIMATE VITAMIN C CONTENT mg
1st week	8.0	0.7
2nd week	11.0	1.0
3rd week	12.0	1.1
4th week	13.0	1.2
5th week	13.5	1.2
6th week	13.5	1.2
7th week	13.5	1.2
8th week	9.0	0.8

and left lung and left ear *Staphylococcus aureus* and *Bacillus coli* were isolated. There were hemorrhagic and bronchopneumonic infiltrations of the lungs. Sections of the costochondral junction revealed changes consistent with scurvy, as shown in Figure 1. No evidences of vitamin A deficiency were manifest.

Case 2 W T, a premature male infant weighing 2 lb., 8 oz., was admitted to the hospital on the 1st day of life after a 'hard delivery'. The father was unemployed, the mother was in good health and worked as a waitress. During pregnancy her diet consisted of orange juice, grapefruit, occasionally cereal, eggs two to three times a week, toast and tea, soup and crackers, occasionally a



Figure 2 *Case 2* High power photomicrograph of the marrow substance near the costochondral junction, showing atrophy of the hematopoietic substance and exposure of the loose textured reticulum

meat, chicken or vegetable sandwich, and not much milk. The child was cyanotic and was resuscitated with difficulty. Examination revealed prematurity, molding of the skull and cyanosis. The case was otherwise not remarkable. The red-cell count was 4,300,000, and the hemoglobin 80 per cent. X rays of the long bones showed no abnormalities.

As the temperature was low, the baby was placed in an incubator. During the first 2 weeks of life he vomited bile stained material and lost weight. The stools were not remarkable, but the temperature was very unstable. The infant was transfused and given several clyses. He was fed by gavage, no cod liver oil or orange juice was given. On the 21st day a large stool was passed consist-

tate omission of the sulfanilamide. In these cases the fever subsided within a few days and failed to recur, even though the administration of the drug was continued.

Finally, there were 5 patients who presented fever as the chief manifestation of a toxic reaction but who, following discontinuation of the therapy and subsequent readministration of the drug, failed to show any further untoward response.

EFFECT OF SULFANILAMIDE ON THE COURSE OF RHEUMATIC FEVER

In the accompanying table we have summarized the incidence and manifestations of toxic reactions in the three different groups of cases composing this study. It is seen that of the 16 patients with moderate to severe rheumatic fever, all except 2 showed a definite febrile reaction—an incidence of 88 per cent. In the inactive group, fever occurred in only 1 case (6 per cent), and 76 per cent escaped without rash or fever. The group of patients with low-grade rheumatic fever manifested reactions which in frequency and character were intermediate between those shown by patients with severe and those with inactive rheumatic fever.

In spite of the rash and fever, patients in the inactive or low-grade rheumatic-fever groups manifesting a toxic sulfanilamide reaction seemed generally well and had no subjective symptoms. In striking contrast is the fact that toxic reactions made those with moderate to severe rheumatic fever feel and appear quite ill. Associated with the fever there was usually a rapid pulse, and pallor. Precordial or anterior chest pain was a frequent complaint.

In no case did sulfanilamide produce any symptomatic relief or shortening of the illness. In fact, in some cases the drug seemed to increase the severity of the disease. One patient with moderately active rheumatic fever had a febrile reaction on the fifth day of therapy, and although the drug was discontinued, this reaction was followed by an immediate rheumatic fever recrudescence characterized by persistent fever, new subcutaneous nodules and congestive failure. Another patient with active disease developed a rash and fever on the tenth day of treatment. In this case, three subsequent attempts at therapy produced further toxic reactions. Tolerance to the drug finally developed and the administration of sulfanilamide was continued for two months. During this period the patient not only failed to improve in appearance but also developed new subcutaneous nodules.

Four patients were treated during a rheumatic fever recrudescence. Fever was already present when the therapy was started. In all 4 cases, asso-

ciated with the giving of sulfanilamide there was a further rise in the temperature (up to 105°F), the pulse became very rapid, and there was an increase in pallor. All the patients became quite ill in appearance, and 2 developed severe joint pains. Following the omission of the drug, the temperature fell to a lower level and the appearance of the patients improved.

Two rather ill patients with severe cardiac involvement were given sulfanilamide at the time of an acute hemolytic streptococcal upper respiratory infection. In spite of the therapy there was an immediate rheumatic-fever recrudescence in each case. Subsequently, both patients died, one forty-two days and the other forty-eight days after the respiratory infection. During this period 2 other patients were treated for such infections with aspirin instead of sulfanilamide, and in both cases these episodes were followed by fatal rheumatic fever recrudescences. Two of these deaths have been previously reported.²

EFFECT OF SULFANILAMIDE ON CHOREA

There were 7 patients with slight to moderate chorea who were given sulfanilamide. Except for the chorea none of these presented any clinical signs or laboratory evidence of active rheumatic fever. Two had previously had active rheumatic fever, and 1 also had clinical evidence of heart disease. The period of drug therapy varied from two weeks to one month. Although 4 of the 7 patients developed a toxic rash, they subsequently became tolerant to the drug, so that treatment could be continued. The therapy had no effect on the natural course of the chorea in any of these patients.

DISCUSSION AND CONCLUSIONS

Toxic rash and fever associated with sulfanilamide therapy of streptococcal, meningococcal and gonococcal diseases have been reported by other investigators.²⁻⁷ Recurrence of the reaction with the subsequent administration of a single small dose of the drug, with positive skin tests in a few cases, has been offered as evidence that these toxic reactions are due to the development of a specific hypersensitivity.⁴⁻⁷ The demonstration here given that tolerance to relatively large amounts of sulfanilamide may develop following the repeated administration of small doses lends further support to the hypersensitivity hypothesis. However, the evidence is still far from proving conclusively that these reactions are due to a hypersensitivity similar to that seen in serum sickness and other allergic manifestations.

Nevertheless, the demonstration that a state of

THE EFFECT OF SULFANILAMIDE ON RHEUMATIC FEVER AND CHOREA

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IN JANUARY, 1937, shortly after Long and Bliss¹ reported the value of sulfanilamide therapy for hemolytic streptococcal diseases, we began to investigate the effect of this drug on patients ill with rheumatic fever and chorea. Such a study seemed warranted because of the close relation of rheumatic fever to hemolytic streptococcal respiratory infections.

The primary purpose of this paper is to report our observations on the effect of sulfanilamide on rheumatic fever and chorea. In addition, we have included a description of certain interesting and important toxic reactions which were encountered.

MATERIAL STUDIED

A total of 58 patients have been treated with sulfanilamide‡. These may be divided into three groups: 16 who were moderately to severely ill with active rheumatic fever, 25 who were convalescing from rheumatic fever but still presented signs of borderline or low-grade active disease, and

Table 1 *Incidence of Rash and Fever Associated with Sulfanilamide Therapy in 58 Rheumatic Fever Subjects*

DEGREE OF RHEUMATIC FEVER	NO OF CASES	TOXIC REACTION	RASH ONLY	FEVER ONLY	RASH AND FEVER	NO RASH OR FEVER
Moderate to severe	16	14 (88%)	—	12 (75%)	2 (12%)	2 (12%)
Low grade (including 7 cases of chorea)	25	13 (52%)	3 (12%)	7 (28%)	3 (12%)	12 (48%)
Inactive	17	4 (24%)	3 (18%)	—	1 (6%)	13 (76%)
Totals	58	31 (53%)	6 (10%)	19 (33%)	6 (10%)	27 (47%)

17 in whom the infection had apparently become inactive. The second group includes 7 patients with active chorea but no other associated evidence of active rheumatic fever. The ages varied from four to twenty-three, and averaged eleven.

Sulfanilamide was administered in divided doses with a total daily dosage of approximately 6 to 7 gr per 10 lb of body weight during the first twenty-four hours, and thereafter 4 to 5 gr. A maintenance dose of more than 60 gr per day was rarely given. In some cases the drug was given in initial small doses, but thereafter the amount was gradual-

ly increased each day until the usual maintenance dose was reached. The duration of therapy varied from a few days to as long as two months.

TOXIC REACTIONS

Of the total of 58 patients given sulfanilamide, 31 (53 per cent) developed toxic reactions. The chief manifestations were rash and fever. The rash was pink or red and usually maculopapular, and occurred on all parts of the body. It was most intense and commonest on the elbows and extensor surfaces of the forearms, and to a lesser extent over the knees and extensor surfaces of the legs. It was observed only once on the face and the palms. It was rarely urticarial, and in 1 case was partially purpuric. Associated with the rash there was slight, if any, itching.

The other important manifestation of this toxic reaction was fever. In some cases the rash was associated with no fever or only slight fever. Occasionally the rectal temperature rose as high as 103°F. On the other hand, fever frequently occurred without any associated rash, and in these cases was usually higher than that which accompanied a rash. These toxic reactions occurred most frequently between the seventh and the twelfth day after the beginning of the drug therapy, but were observed as early as the second and as late as the thirtieth day.

When a toxic rash or fever developed, therapy was usually discontinued and the manifestations of the reaction disappeared within one to three days. Of the 31 patients who developed reactions, 12 had a rash either alone or associated with fever. Of these, 10 were again given sulfanilamide. In some cases the second administration consisted of a single dose of one 5 gr tablet. In 9 of these 10 cases there was a recurrence of a toxic reaction within twenty-four hours, and the drug was again discontinued. Repeated administrations of small doses of sulfanilamide caused repeated reactions, which lessened in severity and finally failed to reappear, even though the dosage was gradually increased to the original amount and was continued for as long as three weeks. The number of reactions observed in a given case before the development of tolerance varied in different individuals from two to six.

There were 2 patients who developed febrile reactions which were not severe enough to necessi-

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‡The sulfanilamide (Prontylin) used in this study was supplied by the Winthrop Chemical Company, New York City.

mous epithelium generally begins next to the high columnar epithelium, the greater part of the initial carcinoma in such cases may develop by carcinomatous transformation of the squamous epithelium which lines the cervical canal. A superficial initial carcinoma without any downgrowth is thus formed, and only a comparatively small part of the carcinoma may be visible at the external os during a speculum examination. If the possibility of squamous epithelium in the cervical canal is overlooked, and a low amputation of the cervix performed, parts of the carcinoma may be left behind. To circumvent such failures, radium as a postoperative routine is indicated rather than a more radical operation.

The most frequent lesion of the cervix is erosion. By this term is meant a defect only in the epithelium as compared with an ulcer, in which the underlying connective tissue is also defective. Whereas erosion of the cervical squamous epithelium is found not too rarely, erosions of the vagina are comparatively infrequent. There are two major reasons for this. One is that the fixation of the vaginal epithelium to the underlying stroma is guaranteed by numerous dovetailing papillae, while in the cervix these papillae are rarer, thinner and smaller, and in some cases, completely absent, secondly, the mechanical tension on the height of the convex cervix is much greater than that on the concave surface of the vagina. The precipitating cause of most of the erosions is the macerating influence of a discharge, whose fluid primarily and directly acts on the cervical epithelium. This accounts for the fact that in nearly all cases of erosion a final and permanent healing can only be achieved when the causal discharge stops, and suggests that routine therapy of erosion should begin with the treatment of the discharge, that is, of the cervicitis. In the healing of an erosion at the junction of the histologic os an activity of both types of epithelium is observed: the columnar from the cervical canal and the squamous from the periphery, both trying to establish themselves on the free and naked surface of the erosion. The columnar epithelium, which consists of one row of cells only, grows more quickly and succeeds in covering most of the field of the erosion. This we call the first stage of healing. Later on, the slower-growing squamous epithelium begins to creep over or under the columnar layer. This is the second stage of healing. This process holds true for the simple erosion. However, in numerous cases the field of the erosion contains glands which are the remnants of a congenital eversion or have developed during the first stage of healing. In such cases, the second stage does not represent a complete healing, as the pressure from the secretions of the glands tends to force

off the surface squamous epithelium. This produces a recurrence of the erosions. A final healing of these glandular erosions takes place only when the squamous epithelium plugs the glands permanently by sending downgrowths into them. Such a procedure, which is a physiologic process of healing based on the normal activity of squamous epithelium, takes a comparatively long time. As a general rule neither the columnar nor the squamous epithelium can grow over the ground of the erosion so long as the tissue is heavily inflamed. The therapy of the erosion therefore falls into three stages: first, the healing of the discharge, secondly, the combating of the inflammation, and thirdly, the stimulating of the potential activity of the neighboring squamous epithelium by substances that support epithelial growth, such as scarlet red.

The most important lesion of the cervix is squamous-cell carcinoma, which accounts for about 90 per cent of the uterine carcinomas, whereas the type arising from the glandular epithelium of the cervix represents roughly 2 per cent. The balance, 8 per cent, is accounted for by carcinoma of the endometrium. This squamous-cell carcinoma begins by carcinomatous transformation of the surface epithelium which takes place, not in the depth, but on the surface, and not in the field of an erosion, but in the intact epithelium. The carcinomatous surface epithelium, the so-called carcinomatous *Belag*, is generally of the same dimensions as the normal epithelium and differs only by the carcinomatous character of the polymorphous and atypical cells, with their hyperchromatic nuclei. There is always a clear-cut cleavage line between normal and carcinomatous epithelium and never a gradual transitional zone. This, the first phase of carcinomatous epithelium, can last many months or perhaps a few years. Later on, in the second phase, the carcinomatous epithelium shows downgrowths, and finally, in the third phase, ulceration takes place. Prior to the third phase, the surface is smooth and naked-eye examination reveals apparently normal tissue. There are a few cases where a clinical diagnosis of carcinoma can be made. Three characteristics make this possible: first, the slightly elevated level of the carcinomatous epithelium, secondly, its finely wrinkled surface, and thirdly, its pale color. However, in a large majority of cases these characteristics are either completely absent or poorly developed.

In these cases, a biological difference between normal and carcinomatous epithelium can be utilized to establish a clinically visible difference in the two epitheliums. The normal epithelium of the cervix contains, in the superficial cell layers, large quantities of granular glycogen, which is produced and stored by the cells. Carcinomatous epithelium

tolerance can be brought about may be of some practical importance in cases where a toxic rash or fever appears in an individual being treated with sulfanilamide for a disease which usually responds to the drug

Hageman and Blake⁴ observed febrile reactions in 21 of 134 cases being treated with sulfanilamide, an incidence of 16 per cent, while Schwentker and Gelman³ noted a rash in 10 out of 180 patients (6 per cent). In contrast to these figures is the high incidence of toxic rash and fever in our series (53 per cent). Furthermore, an analysis of our patients shows that those with active rheumatic fever are more prone to develop febrile reactions than are those in whom the disease is quiescent. We can offer no explanation of this difference.

Recurrences of rheumatic fever following hemolytic streptococcal respiratory infections in spite of sulfanilamide therapy, and the lack of beneficial effects of this drug on the course of rheumatic fever and chorea, have been noted above. Because of these facts, and because rheumatic fever patients are very prone to develop severe febrile reactions to sulfanilamide, we believe that the administration of this drug is contraindicated in the presence of active rheumatic fever.

SUMMARY

1 Sulfanilamide was administered to 58 rheumatic-fever patients.

2 After two days or more of drug therapy a toxic rash or fever developed in 53 per cent of the cases.

3 In 9 individuals manifesting such toxic reactions, the repeated administration of small doses caused the development of a state of tolerance.

4 Patients ill with active rheumatic fever were particularly prone to develop severe febrile reactions. This fact, together with the lack of any observed beneficial results, makes the administration of sulfanilamide contraindicated in the presence of active rheumatic fever.

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EARLY DIAGNOSIS OF CANCER OF THE CERVIX UTERI

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THE human cervix uteri consists of two entities—the external os and the internal os. By naked-eye inspection the external os is defined as that point between the narrow cervical canal and the surface of the vaginal portion (portio vaginalis) of the uterus. This we call the anatomic external os as it is determined by anatomical means. By microscopical examination, the external os is defined as that point where the non-hornified stratified squamous epithelium of the portio meets the high columnar mucinous epithelium, containing many glands, which lines the cervical canal. This we call the histologic external os as it is determined with the aid of the microscope. Normally the anatomic external os and the histologic external os coincide, but epithelium typical of the external os may extend inside or outside the normal anatomical limits. Such conditions are to be judged as pathologic and are not too rare.

When the cervical mucous membrane is not limited to the cervical canal but extends out to cover, in varying degrees, the area about the external os, we have an abnormality which occurs in a certain disturbance of fetal development. This congenital eversion was found to be present in more than 20 per cent of all newborn girls by the late embryologist, Fischel, who published these findings in one of his early papers. In the first few months of extrauterine life, the misplaced cervical epithelium becomes replaced by squamous epithelium, and the abnormality is thus corrected. Only a small percentage of all women retain this congenital eversion throughout life.

On the other hand, in hypoplastic individuals with genital infantilism we find that the squamous epithelium of the external os ascends into the lower part of the cervical canal, occasionally up to half or even three quarters of its length. This variation is of great practical importance in certain cases of carcinoma. Since carcinoma of the squa-

of prostatic age, the frequency of urinary symptoms in the female and the effects of infection of the urinary tract are factors which must be evaluated before a definite diagnosis of true neurogenic vesical dysfunction in pernicious anemia can be established, but the number of cases recognized would be materially augmented if in taking the history a detailed questioning of the patient were insisted on in order to detect those symptoms which might be the signal of vesical involvement, and if some definite plan of urological investigation were carried out. By this program many cases of asymptomatic or preclinical vesical dysfunction would be diagnosed.

Before discussing the urinary tract disturbances it is essential that we be cognizant of the underlying pathology of the disease. It is well recognized and generally accepted that neurologic manifestations in pernicious anemia are dependent on pathologic changes in the posterior and lateral columns of the spinal cord. It is obvious that, as a result of such changes, interference with the normal physiology of the bladder will occur in many individuals, and that they will present the signs and symptoms of neurogenic vesical dysfunction.

Symptoms of vesical dysfunction in pernicious anemia depend in great measure upon the stage of the disease in which the patient is first seen and upon the presence or absence of infection of the urinary tract. It should be emphasized that definite bladder involvement may be present with symptoms referable to the urinary tract so mild that no significance may be attached to them either by the patient or by the examining physician or the patient may be seen in the asymptomatic stage, at which time a diagnosis of vesical dysfunction can be made only by cystometric study. In most cases the earliest symptom of such dysfunction is bladder difficulty. This may present itself as initial retardation or hesitancy, diminished force of the urinary stream, terminal dribbling or the sensation of incompletely emptying the bladder. Such symptoms are, of course, also consistent with obstructive changes at the bladder neck. As impairment of vesical sensation progresses, the individual becomes less conscious of bladder fullness, and the interval between voidings is prolonged. Vesical distention and urinary retention increase, and finally overflow incontinence develops. Frequency, urgency and painful urination are encountered with the advent of infection, which is frequently the result of injudicious catheterization. Renal pain, chills, fever and toxemia indicative of upper urinary tract involvement develop in many cases and an advanced pyelonephritis commonly results. It should be noted that marked renal damage can occur in these patients in the

absence of local signs or symptoms referable to the kidneys. In a series of postmortem examinations on pernicious-anemia patients, Goldhamer et al.⁵ found renal damage in 83 per cent of the group.

The recognition of neurogenic vesical dysfunction in patients suffering from pernicious anemia is at times extremely difficult, especially in the early and borderline groups. Prompt diagnosis is essential, however, and the timely institution of effective treatment is imperative so that the progress of vesical dysfunction can be arrested and further damage to the bladder prevented. Where we are dealing with an atypical or relatively normal blood picture, the diagnosis of primary anemia may be established by urological study. A definite program of study should be carried out directed to the differentiation of the obstructed and the neurogenically disturbed bladder. It must be understood that they may coexist in many cases. It is well known that bladder paralysis due to spinal-cord disease is most frequently produced by tabes dorsalis, and this factor must be definitely excluded. Cystoscopy and cystometry are invaluable. Inspection of the bladder outlet is particularly helpful in proving the absence of definite obstruction as the chief factor in the urinary story.

The appearance of the bladder itself in pernicious anemia is not characteristic. As might be expected, it resembles in every particular the "tabetic" bladder and presents the picture of diffuse fine trabeculation, diminished sensibility to instrumentation, increased tolerance to distention and a sluggish expulsive force. The rectal sphincter is in many instances relaxed. Cystometric examination is the most informing diagnostic procedure, as the response of the bladder musculature to a process of gradual stretching and the patient's sensory reaction to its filling are the most delicate criteria of neurogenic disturbance, and the finest index of neurogenic improvement following the institution of liver therapy. In the pernicious-anemia bladder, the normal gradual ascendancy of the pressure curve becomes flattened in various degrees, the first indication to void is prolonged, and the maximum voluntary pressure is diminished.

Marked urinary disturbances may predominate in some cases, with the result that the patient first consults the urologist because of symptoms referable to the genitourinary tract, and the latter must be careful not to overlook the underlying primary disease. On the other hand, all cases of pernicious anemia, with or without apparent neurologic involvement and whether or not presenting an atypical blood picture, should be studied with the possibility of a preclinical or early neurogenic bladder in mind. Attention must be directed particularly

loses the potency to produce as well as to store glycogen and is therefore free from this substance. To differentiate the glycogen-containing and glycogen-free areas, the cervix is brought in contact with a dilute aqueous solution of iodine. The best solution has been found to be one containing 1 gm. of iodine, 2 gm. of potassium iodide and 300 cc. of water. This solution stains the normal, glycogen-containing cervical epithelium a dark brown, whereas carcinomatous epithelium remains pale. In carrying out this procedure the following steps are employed: first, expose and clean the cervix, secondly, pour 10 or 20 cc. of the iodine solution into the vagina, being careful to distribute it throughout, and thirdly, after 40 to 60 seconds examine the cervix carefully. Brown areas are normal, pale, unstained areas are suggestive of carcinoma but are not pathognomonic. There are several other pathologic changes which also prevent the production and storage of glycogen. Hyperkeratosis from prolapse, in consequence of syphilis or of the idiopathic type, can be responsible for unstained areas. Which one of these various causes is responsible for the absence of staining must be determined histologically. Since only a biopsy of the surface epithelium is necessary, there is no need for an exploratory excision. Scraping the surface epithelium with a sharp curet is sufficient. *The diagnosis can and should be made before the phase of downgrowth.*

Years of experience have proved that carcinoma usually begins in perfectly normal cervixes. The

test should not be confined to suspicious cases, such as elderly women with eroded cervixes, but should be done as a routine procedure in all patients with gynecological complaints and, if possible, in all women, including the comparatively young. If the latter were possible, we should be able to discover carcinoma of the cervix in a phase of its development which would offer a chance of cure of nearly 100 per cent.

DISCUSSION

DR. PATRICK E. MCSWEENEY, Burlington. I express my thanks and appreciation to Dr. Schiller for his excellent paper. There are a few points which I should like to emphasize. The instruction of the laity in the necessity of periodic health examinations has brought many women to us in the so-called precancerous stage. By carrying out the following procedures the death rate from cancer, in my opinion, can be reduced 50 per cent.

First, every woman past the age of thirty-five should be examined vaginally every six to eight months. Visualization of the vagina and cervix by speculum is a necessary part of the examination.

Secondly, women past the age of thirty-five who have borne children should undergo some method of surgical repair of the cervix, if indicated.

Thirdly, vaginal discharge should be traced to its origin and cleared up if possible. Vaginal discharge is a frequent cause of erosions, which in turn may be precancerous lesions.

Fourthly, early cancer of the cervix can best be treated by radium (2000 to 3000 mg. hours).

Fifthly, advanced cases of cancer of the cervix are best treated by radium (4000 to 6000 mg. hours).

DISTURBANCES OF BLADDER FUNCTION IN PERNICIOUS ANEMIA

CHARLES J. E. KICKHAM, M.D.,* AND WILLIAM C. MOLONEY, M.D.†

BOSTON

TOO little attention has been directed to the fact that disturbances of bladder function are among the frequent manifestations of neurologic involvement in pernicious anemia. Woltmann¹ in 1919 published the first statistical study of the subject, and reported from his series an incidence of bladder involvement of 13.6 per cent, reference to vesical complications had been made in earlier contributions by Bowman,² Taylor³ and Billings.⁴ Goldhamer and his collaborators,⁵ in 1934, emphasized the high incidence of vesical dysfunction in pernicious anemia, while Hyland and Farquharson,⁶ in a recent excellent contribution, have reported a 21 per cent incidence in a study of 172 cases.

On the other hand, Caulk⁷ did not record a single case of pernicious anemia with bladder disturbance in a series of 500 cases of so-called cord bladder, for which Smith and Engel⁸ have suggested the more appropriate term "neurogenic vesical dysfunction." Kretschmer⁹ in 1921 discussed this aspect of the disease in the urological literature. There have been no other urological papers on the subject.

With improved neurological diagnosis, the advent of liver therapy and the recent advances in the art of cystometry, further investigation of this most important phase of pernicious anemia might well have been anticipated. It is the purpose of this paper to emphasize the importance of recognizing vesical dysfunction in this disease, and to describe briefly its general features. To be sure the common occurrence of bladder disturbances in men

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phocytes 47 per cent, eosinophils 4 per cent and monocytes 5 per cent. The blood urea nitrogen was 33 mg per cent. The blood Hinton and spinal fluid Wassermann tests were negative. The urine was cloudy and alkaline with a specific gravity of 1.016, there was a trace of albumin but no sugar. The sediment contained a large amount of pus. Culture showed *Bacillus coli* and *Staphylococcus aureus*. A phenolsulfonphthalein 2-hour renal function test showed 10 per cent excretion the first hour and 14 per cent the second. Gastric analysis revealed no free hydrochloric acid. The hematocrit determination demonstrated an MCV of 122 μ^3 . Cystoscopy revealed a classical picture of cord bladder, with evidences of marked infection. Cystometry showed a markedly atonic bladder with the first desire to void occurring after 520 cc. had been injected, with a resulting intravesical pressure of 12 mm. of mercury. The maximum voluntary pressure was 35 mm. at 760 cc.

Following admission, the patient was placed on indwelling catheter drainage, the bladder was emptied by gradual decompression, and a closed system of irrigation was effected. He was given concentrated liver extract intramuscularly, and because of the low hemoglobin, ferrous sulfate was administered. Ammonium chloride and mandelic acid were given to combat urosepsis. On this program there was gradual clinical and laboratory improvement. The red cells reached 5,420,000, and the hematocrit reading fell to 88 μ^3 . There was marked neurologic improvement. The gait was much better. The Romberg test became negative and the Babinski reflex disappeared. There was no improvement of the vibratory sensation. In other words, there was regression of some neurologic signs with progression of none. On July 28, 1937, the cystometric study disclosed marked improvement, although the bladder was still far from normal. The first desire to void was at 350 cc. with a pressure of 20 mm., and the maximum voluntary pressure was 64 mm. at 600 cc. The urethral catheter was removed 1 month later, after which the patient voided without difficulty in satisfactory amounts. The residual was as low as 120 cc. In spite of continuous liver therapy, however, urinary symptoms recurred, the residual urine mounted, and the patient finally developed a septic temperature with toxemia. A suprapubic cystostomy was done on October 7. The convalescence was uneventful. The patient was discharged on suprapubic drainage on November 29.

This patient on admission presented a problem in diagnosis. However, in view of the physical and neurological findings, the laboratory data, the negative serological tests and the cystometric readings,

we decided that the case was one of advanced neurogenic vesical dysfunction due to pernicious anemia. The marked return to normal of the blood picture, the clinical progress and the cystometric improvement confirmed this diagnosis. In this case, however, cord damage of an irreversible nature had doubtlessly taken place, with the result that irrecoverable damage to the detrusor had developed. The important role of urosepsis as an additional deleterious factor is well demonstrated, since it precipitated the necessity for surgical drainage.

SUMMARY

The importance of early recognition of neurogenic vesical dysfunction in pernicious anemia and the necessity of prompt and adequate liver therapy in order to prevent irrecoverable cord and detrusor damage are emphasized.

Cystometry is shown to be an accurate diagnostic procedure in both preclinical and clinical vesical dysfunction of neurogenic origin and to be the most important qualitative index of recovery.

Two illustrative cases are recorded.

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to this type of case as it is here that early diagnosis may be missed

There has been some diversity of opinion as to the efficacy of liver therapy on the neurologic lesions of pernicious anemia. However, recent studies, notably those by Hyland and Farquharson⁹ and by Strauss and his co-workers,¹⁰ have shown that adequate liver therapy can prevent the development of central-nervous-system involvement, and that if such changes have taken place, it can arrest and cause regression of the process. Certainly, intensive, prolonged and adequate parenteral liver therapy should be the watchword in cases with vesical disturbances. Unless the institution of treatment is prompt and adequate, especially when the lesions are well established, the detrusor may become so atonic that its contractility is permanently lost, even though the cord injury may be reparable. A specific program of urological therapy is not indicated in the earlier stages, although general measures should be employed, directed to the prevention of urosepsis and of deteriorative changes in the upper urinary tract. As vesical dysfunction progresses and bladder symptoms develop, accompanied by urinary retention, attempts to improve the expulsive power of the detrusor by medication and education should be made. More drastic measures are essential when we are dealing with an infected bladder and when the clinical picture suggests a pyelonephritis or an impending uremia. In this group, continuous vesical drainage must be accomplished either through the indwelling catheter—a hazardous procedure—or by suprapubic cystostomy. Tidal drainage as described by Munro and Hahn¹¹ is of great value in these patients.

Case 1 An American male, aged 61, entered the Blood Clinic of the Carney Hospital on July 30, 1937, complaining of numbness of the extremities and a staggering gait of 2 years' duration. There was a history of gradual loss of weight and strength, a sore tongue, some gastric distress and recent dyspnea and palpitation. The patient also experienced difficulty in initiating the flow of the urinary stream, had a sensation of incomplete emptying of the bladder, and had terminal dribbling. The symptoms had been progressive. The most annoying feature of the illness was the staggering gait.

Physical examination showed a fairly well-developed and well-nourished man with a very sallow complexion. The hair was gray. The tongue was pale, smooth and glossy. There was marked edema of both lower extremities. The rectal sphincter was slightly relaxed. The prostate was small, soft and benign. The vibratory sense was absent in the upper and lower extremities. The gait was ataxic. The position sense test of finger to nose was satisfactory, that of heel to heel was poor. The Romberg test was positive. Reflexes of the biceps, triceps and extensors were equal and active, the knee and ankle jerks were absent. The Babinski was doubtful. The sensorium was clear. There was definite weakness of the upper and lower extremities. The red blood-cell count was 1,530,000, the white-blood-cell count 1600, and the hemoglobin 48 per cent. On smear there was definite macrocytosis, no nucleated red cells

were seen, the polymorphonuclears numbered 49 per cent, lymphocytes 47 per cent, eosinophils 3 per cent and monocytes 1 per cent. A blood Wassermann test was negative. The urine was clear, amber and acid, with a specific gravity of 1.018. There was no albumin and no sugar. The sediment contained occasional white blood cells and epithelial cells. The culture was negative. The residual urine measured 15 cc. Cystometry showed a somewhat atonic bladder with the initial desire to void after 350 cc. had been injected with a resulting intravesical pressure of 14 mm. of mercury. The maximum voluntary pressure was 32 mm. at 480 cc. Gastric analysis showed no free hydrochloric acid.

On admission a diagnosis of pernicious anemia with combined degenerative disease of the spinal cord was made. Cystometric study suggested early neurogenic vesical dysfunction. The patient was placed on a program of adequate parenteral liver therapy. There was steady improvement. Eleven weeks after the institution of therapy, the red-cell count was 5,880,000, and the hemoglobin 98 per cent. Neurologic improvement was dramatic, and the bladder difficulties markedly improved. The last cystometric readings were the initial desire to void was at 220 cc., with 16 mm. pressure, the maximum voluntary pressure was 54 mm. at 475 cc., there was no change in the residual urine.

This case is an illustration of early neurogenic vesical dysfunction in pernicious anemia. The clinical and cystometric improvement shows conclusively the efficacy of liver therapy in neurologic manifestations of the disease.

Case 2 An American male, aged 70, was admitted to the Carney Hospital on May 17, 1937, complaining of inability to void. There was a history of progressive loss of strength for 4 years. He was uncertain as to the date of onset of his bladder difficulty, but had had nocturia, hesitancy and a sensation of incompletely emptying his bladder for 1 year. His gait was stumbling in character. He experienced considerable gastric distress. The patient had always been well prior to his present illness, although at the age of 24 he had had some injection treatments for what he thought might have been syphilis. The past history and family history were otherwise irrelevant.

Physical examination revealed a pale, elderly man in no apparent distress. The hair was thin and gray. The tongue was glossy. The pupils were equal and reacted to light and distance. The heart and lungs were negative. There was a large, non-tender mass in the lower mid-abdomen, which was flat by percussion. The kidney regions were negative. The external genitals were negative. Digital examination of the rectum found the sphincter relaxed. The prostate was small, soft and benign. There was slight pitting edema of both lower extremities. The sensorium was clear. There was no cranial nerve involvement. Sensory disturbances consisted of slightly diminished perception of heat and cold, and of slight touch and pinprick in the lower extremities. The vibratory sense was absent in the lower extremities. There was no motor involvement except weakness in the legs. The deep reflexes in the upper extremities were equal and active. The Hoffmann sign was not present. The knee jerks were hyperactive equally. The ankle jerks were normal. The Babinski was present. The Romberg was positive. The gait was not typical. The red blood cell count was 2,920,000, the white-blood-cell count 10,450, and the hemoglobin 50 per cent. On smear the red cells were normal in size and achromic, the platelets were normal, the polymorphonuclears numbered 44 per cent, lym-

deepest pair of forceps. With a Kelly hemostat each pair of forceps was grasped and removed through the perineal incision. A No. 20 Fr urethral catheter was placed for continuous bladder drainage, and the perineal wound was closed, with drainage. The convalescence was prolonged because the patient was unco-operative and removed his catheter several times and also because there was a more or less septic condition of the urethra, due to the length of time the forceps had remained there.

SUMMARY

A case of foreign bodies (three pairs of tissue forceps) in the urethra of a man with multiple sclerosis is described. Following operative removal, the patient made a complete, though delayed, recovery from his urethral difficulties.

868 Beacon Street.

FOREIGN BODIES IN MALE URETHRA

Report of an Unusual Case

AUGUSTUS RILEY, MD *

BOSTON

THE case of a man with multiple sclerosis who was recently treated at the Boston City Hospital for foreign bodies in his urethra is so unique that it should be reported

CASE REPORT

A 34 year-old man was admitted to the hospital complaining of 'three pairs of tweezers' in his urethra. He



Figure 1. This photograph shows the prongs of one pair of tissue forceps protruding through the glans penis on either side of midline just below the external meatus, and the sinus at the penoscrotal angle

stated that 2 years previously, when he and "a girl friend were just playing around, the first pair of forceps was pushed into the urethra, with the closed end foremost. A second forceps, he said, was inserted some time later in an attempt to extract the first, and about 6 months before his coming to the hospital a third forceps was inserted in an effort to remove the other two. He offered no explanation as to why each forceps had been inserted with the closed end first, even when asked how he had expected to grasp the other forceps in that manner. There had been only slight pain and no urinary difficulty previous to admission.

About 6 years before, the patient noticed that his right leg gave way when he was walking. Five years previously he awoke one morning with numbness of both legs, and was unable to move them. A short time later he began to have weakness in the left leg to as great a degree as in the right. It increased so much that he had to give up

his job as a truck driver. On entry he was unsteady when standing alone, and was unable to walk unassisted.

Physical examination showed a somewhat emaciated, white male, with marked scoliosis and kyphosis, who was unable to walk without assistance. The glans penis was penetrated on both sides of the frenum just below the external meatus by the prongs of a pair of tissue forceps, which extended about 1 cm. beyond the under surface of the glans. The forceps was about 10 cm. long, and was easily palpable in the urethra with the closed end at the penoscrotal angle. At that angle there was a urethral fistula and the prongs of another forceps could be felt. About 1 cm. deeper in the urethra the prongs of a third forceps were felt. The closed ends of the second and third



Figure 2. The three pairs of forceps removed from the urethra. The pair showing the most erosion was farthest in the urethra and apparently was the first to be introduced

pairs were felt in the perineal portion of the urethra.

The patient was well oriented and co-operative, and expressed no abnormal ideas, but seemed distinctly irrational. Examination of the cranial nerves was negative. There was a marked weakness of both legs and to a lesser extent of the right hand. The gait was unsteady. There was no definite level of sensory disturbance. The vibratory sense in the ankles was lost. There was hyperesthesia of the legs and trunk to pinprick. There were a positive Babinski and exaggerated ankle clonus and ankle jerks. The reflexes of the right arm were more active than those of the left. The right foot and ankle were cyanotic, and colder than the left. On laboratory examination the spinal fluid and blood were normal.

A diagnosis was made of multiple foreign bodies in the urethra and multiple sclerosis.

Operation was performed under spinal anesthesia. A perineal urethrotomy was made over the closed end of the

From the Urological Service, Boston City Hospital. Presented before the New England Branch of the American Urological Association, Boston, November 18, 1937.

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deepest pair of forceps. With a Kelly hemostat each pair of forceps was grasped and removed through the perineal incision. A No. 20 Fr. urethral catheter was placed for continuous bladder drainage, and the perineal wound was closed, with drainage. The convalescence was prolonged because the patient was unco-operative and removed his catheter several times and also because there was a more or less septic condition of the urethra, due to the length of time the forceps had remained there.

SUMMARY

A case of foreign bodies (three pairs of tissue forceps) in the urethra of a man with multiple sclerosis is described. Following operative removal, the patient made a complete, though delayed, recovery from his urethral difficulties.

868 Beacon Street.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24211

PRESENTATION OF CASE

A sixty-seven-year-old, white, American man entered the hospital with the complaint of epigastric pain of eleven days' duration.

Seven years before entry he was hospitalized for one week for "intestinal stoppage." Treatment consisted of turpentine stupes and enemas, and he was discharged well. He was well until six months before entry when he began to have epigastric distress and gas pains which were greatly relieved by food and soda. For the next four months he continued to have these symptoms, but they became less severe. About two months before entry he began to have indigestion which to him meant a dull nonradiating ache in the upper abdomen with gaseous eructations and loss of appetite. He also had increasing constipation. Eleven days before entry he was awakened from sleep at two o'clock in the morning by a persistent, sharp, moderately severe, nonradiating, epigastric pain accompanied by some nausea but no vomiting. He did not sleep any more that night, but the following morning was able to do his work driving a bus. The pain continued and two or three days later became more severe, forcing him to go to a hospital where he remained up to the time of entry here. The pain was not relieved by taking food. During the acute illness he had almost no appetite, and in spite of enemas, passed only a little gas by rectum and very little feces. He did not know whether he had lost weight. He had no jaundice, chills, colicky pain, hematemesis, melena or genitourinary symptoms. For some time he had been treated by his physician for angina pectoris and regularly took "white pills" under his tongue for relief of his attacks. He stated that the pain of his present illness in no way resembled his anginal pain. His past history was otherwise negative, and his family history was noncontributory.

Physical examination revealed a well-developed, fairly well-nourished man complaining of moderate abdominal distress. The heart was slightly enlarged to the left, but the chest was otherwise negative. The blood pressure was 130 systolic, 70 diastolic. The abdomen was moderately distended and tympanitic throughout except in the right lower quadrant where it was dull. There was gener-

alized tenderness, most marked in the epigastrium. No masses were made out, and liver dullness was obliterated. Peristalsis was diminished but high-pitched in tone. Rectal examination was negative.

The temperature was 99.5°F., the pulse 75. The respirations were 20.

The blood showed a red-cell count of 4,800,000 with 75 per cent hemoglobin, and a white-cell count of 13,200 with 88 per cent polymorphonuclears. The nonprotein nitrogen of the blood was 27 mg and the protein 5.9 gm per cent. The van den Bergh was too low to read. The chlorides were equivalent to 107 cc of N/10 sodium chloride. A flat x-ray plate of the abdomen showed an unusual central convexity of the right side of the diaphragm with a horizontal anterior costophrenic angle. The diaphragm moved well with respiration, and there was no evidence of fluid above it or air beneath it. The lung fields were essentially clear, and there was no evidence of varices in the esophagus. The splenic flexure of the colon was unusually high. When the patient was in the upright position, there was a single loop of slightly dilated small bowel in the center of the epigastrium which contained gas and fluid. The colon contained a small amount of barium and showed no evidence of dilatation. Films taken at the hospital where the patient had been before entry here showed an unusually high stomach and a large duodenal loop. A repeat flat film of the abdomen taken the day after entry showed no definite change except that the colon was filled with gas and appeared to be moderately dilated.

On the day following entry the patient experienced rather severe, persisting, epigastric pain which was more severe than any he had had previously and was not relieved by morphine. His abdomen was tense, distended and very tender, with maximum tenderness just above and lateral to the umbilicus. The white-blood-cell count was 18,200.

A laparotomy was performed on that day.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON. These upright films of the abdomen were taken on the day of entry and the barium that you see here in the colon was administered before he came in. As the note states, there was no free air beneath the diaphragm and the diaphragm moved well with respiration although it did show this queer central convexity on the right side. We have seen a shadow like this on several occasions and each time we have become excited about it, but it has always turned out to be nothing but an anatomic variation. We gave

barium and ruled out varices in the esophagus. We could not examine the stomach satisfactorily at that time, but at the previous examination done outside the hospital the stomach, duodenum and colon were normal. The upright film shows this single loop of dilated, gas-and-fluid-filled small bowel in the center of the epigastrium. It is the only definite, abnormal finding we saw.

DIFFERENTIAL DIAGNOSIS

DR. FRANKLIN G. BALCH, JR. In reviewing the history, we have a man of sixty-seven who was well until six months before he came into the hospital. The point that strikes us first is that at that time he had epigastric distress relieved by food and soda, which makes us wonder if he had a duodenal ulcer. The x-rays seem to rule that out. Also, if he had an ulcer with a subacute perforation just eleven days before entry he should have been sicker at the time of entry. If he had had a subdiaphragmatic accumulation of fluid he certainly ought to have shown evidence of it in the x-rays. His diaphragm should not have moved freely, and he should not have had normal respiration. Carcinoma of the stomach can also be ruled out on the x-ray findings.

How about the possibility of gall-bladder disease to explain his trouble? I believe that gall-bladder disease could account for the attack of epigastric pain six months before entry with symptoms relieved by food and soda. He was able to go back to work after his episode eleven days before entry, and that too is consistent with such a diagnosis. When he came into the hospital his symptoms were those of obstruction, with a distended abdomen and epigastric pain. I think we can rule out obstruction of the large bowel by the x-ray and by the fact that his pain was entirely epigastric. The symptoms were too intermittent in character for an acute obstruction caused by volvulus or intussusception. He has apparently had obstructive symptoms which have subsided and then recurred.

We have to think of appendicitis but I do not believe that it enters into this picture because he did not have paralytic ileus. He has had no previous operation to suggest the possibility of adhesions. Carcinoma of the small bowel must be considered. It is a rare disease, but it does give intermittent obstruction such as this patient has had. It may last a period of several months or even a year, but if it had been going for as long as six months I should expect the patient to have been more cachectic. He apparently was a fairly well-nourished man.

Some form of mechanical obstruction in the bowel must be thought of. I am probably a little

biased in favor of the possibility of gallstone colic, as I have had occasion to look up some cases here recently. I found only 10 in the hospital records from 1898 to 1932. It occurs in the older age group and is characterized by intermittent symptoms. I believe that the attack six months previously might perfectly well have been a gall-bladder attack and that the episode eleven days before entry was perhaps when the stone ulcerated through into the bowel. It is customary with this type of disease that, as the spasm lets up, the patient may pass gas and fecal material until the stone obstructs again. The stones may or may not show by x-ray. There were 6 cases in this series in which an x-ray was taken, stones showed in 3 of these. The fact that nothing showed up in the x-ray does not necessarily mean that he did not have a foreign body obstruction. I am therefore going to make a diagnosis of mechanical obstruction in the upper small bowel, probably from a gallstone.

CLINICAL DISCUSSION

DR. ARTHUR W. ALLEN This man presented a very interesting diagnostic problem. He had been x-rayed in a hospital in a neighboring city, and the x-ray man had made a diagnosis of carcinoma of the pancreas on the basis that the stomach was pushed up by something, and the patient was sent in here with that diagnosis. We were a little suspicious, however, and did not agree with it. On entry the man was so well that we felt we could watch him for a while and study him a little more, but following the x-ray examination done in this institution he had a recurrent episode of acute abdominal discomfort. The history, so far as it is given, is quite accurate, but it does not really give much idea as to how ill he looked after he had had his second episode of pain. He was in shock and the abdomen was distended and very tender, particularly in the epigastrium, in the left upper quadrant and to the left of the midline. We decided that he had some form of intestinal obstruction. We cast about in our minds for various possibilities as to the diagnosis and I am not clear now why we happened to make the correct one, because it was not so clear as it might sound. However, we operated on him with a preoperative diagnosis of a mesenteric thrombosis. Perhaps it was the extreme illness of the patient that made us feel that that was his trouble. We did find that almost the entire jejunum was gangrenous, but in a different way from what we usually see in mesenteric thrombosis, that is, it had intermingled spots of necrosis and of almost normal-looking bowel over a distance of about 3 or 4 ft. The mesentery of the bowel was tremendously

thickened, and there were a great many enlarged lymph nodes in it. The bowel was greatly dilated and did not have the clear-cut, frankly gangrenous appearance that we see with the usual thrombosis that occurs in the artery. We believed that it was a venous thrombosis, cause unknown. In retrospect, I think that this diagnosis more adequately explains the episode ten days previously. We had to resect the jejunum from just a few inches below the ligament of Treitz for 3 or 4 ft and did an end-to-end anastomosis. Much to our surprise he completely recovered, after a stormy convalescence, and went home.

A PHYSICIAN: How often do you see a white count as low as that with mesenteric thrombosis?

DR ALLEN: I knew someone would speak of that. In any thrombosis that occurs in the artery it is apt to be high (30,000 to 40,000). The count of 18,000 bothered us in making the preoperative diagnosis, but we believed it was not the kind of mesenteric thrombosis that we commonly see. We considered seriously the question of gallstone ileus and were hesitant about ruling it out. It would stand up perfectly well with the story as he gave it.

A PHYSICIAN: Are the x-ray findings characteristic of 4 ft of gangrenous small intestine?

DR HAMPTON: They are not characteristic of anything. A man as sick as he was from any other disease would probably show a little gas in his small bowel. I have no proof, but I think the routine case of mesenteric thrombosis shows very little.

PREOPERATIVE DIAGNOSIS

Mesenteric thrombosis

DR. BALCH'S DIAGNOSIS

Gallstone ileus

ANATOMICAL DIAGNOSES

Thrombosis of superior mesenteric vein
Gangrene of jejunum

PATHOLOGICAL DISCUSSION

DR TRACY B. MALLORY: The term mesenteric thrombosis as used by clinicians covers three entirely separate types of vascular lesions in the mesentery. The commoner types of vascular occlusion are arterial, these may be divided into those caused by a local thrombosis developing on the basis of atherosclerotic plaques within the mesenteric artery or by an embolus breaking loose from the heart or aorta and swerving down the mesenteric artery. Probably embolus is the commonest etiologic agent. Then there is a third type where the occlusion is on the venous side, sometimes associated with septic phlebitis, other times appar-

ently a bland thrombosis, which was the case here. This specimen showed complete occlusion of the entire venous system up to a point about 10 cm from either margin of the resected gut, where the vessels became patent again. The arteries throughout the specimen were perfectly free of clots. The gut was gangrenous in part but not so completely as one would expect with a ten-day story of arterial occlusion.

A PHYSICIAN: Does a process such as this ever develop into portal thrombosis?

DR MALLORY: There is always that possibility.

DR ALLEN: You have no light to throw on the etiology of this condition?

DR MALLORY: Not the slightest.

A PHYSICIAN: What was the significance of the previous six-month story?

DR MALLORY: One wonders always whether a volvulus or intussusception could be the initiating factor by slowing circulation long enough to let the thrombotic process start, but I have never seen any evidence to prove that such is the case.

CASE 24212

PRESENTATION OF CASE

A twenty-eight-year-old, white, American electrical engineer entered the hospital for treatment of a recurring tumor of the chest wall.

Five and a half years before entry he noticed a lump on one of the ribs of the left side of his back. Part of the rib was removed by his surgeon following which the patient was discharged as well. Two years later he noticed enlargement of the stump of the resected rib and extension of the tumor to the adjacent rib. The remains of the stump and the adjacent rib were resected, and he was sent to a Boston hospital for follow-up treatment. Eight months later the tumor recurred in the operative scar and was again removed surgically. It recurred again twenty-seven months later on the rib stump, and again was resected. Seven months later, one week before entry, an x-ray was taken at another hospital which showed a "questionable area at the base of the right lung." At the time of entry he had no symptoms, and he had always been in excellent health. He had never been exposed to tuberculosis and had never had heart or lung trouble of any kind. He had not lost weight or strength. His family history was noncontributory.

Physical examination revealed a well-developed and nourished man apparently in excellent health. There were healed surgical incisions on the posterolateral aspect of the left chest and questionable slight muscular atrophy in the right subclavicular region. The lungs showed a few rales at the right

base but were otherwise negative. The heart and abdomen were negative, and the blood pressure was 130 systolic, 60 diastolic.

The temperature was 98.6°F, the pulse 88. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,460,000 with 80 per cent hemoglobin, and a white-cell count of 6300 with 67 per cent polymorphonuclears, 27 per cent lymphocytes and 6 per cent monocytes.

An x-ray of the chest showed a rounded mass measuring about 4 cm. in diameter which was continuous with the right posterior costophrenic angle at about the posterior axillary line. The costophrenic angle was obliterated, apparently by a small quantity of fluid. The remainder of the right lung was clear. There was a small, in definite, rounded nodule measuring less than 1 cm. in diameter overlying the anterior end of the left fourth rib. The left lung was clear. There were no mediastinal masses, and the rib resected at the previous operations had not regenerated.

An operation was done on the eighth day.

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES: It is interesting that the mass appears on the opposite side from where his previous trouble had been. The mass itself is obviously in the lower portion of the right lower lobe.

DR. RICHARD H. WALLACE: Is there any evidence of calcification?

DR. HOLMES: No. It has a very indefinite margin, and there is a peculiar band above it. It looks more like an infiltrating tumor than a sharply localized, encapsulated lesion.

DR. WALLACE: Can you demonstrate the nodule described at the end of the previously resected rib?

DR. HOLMES: No, I think they must have operated again. The end of the rib is perfectly smooth.

DR. WALLACE: Is there one rib entirely missing?

DR. HOLMES: Yes.

There is no evidence of anything on the left side, and no pleural change. On the right side you have a poorly defined lesion with some fluid in the pleural space. It could be due to a malignant tumor or to an inflammatory process. I do not believe that it could be due to benign tumor.

DIFFERENTIAL DIAGNOSIS

DR. WALLACE: Our problem is one of deciding the nature of the tumor arising in a rib and recurring locally four times over a period of five and a half years, in a young, healthy individual. I suppose we should mention gumma in any tu-

mor of the chest wall, but as there is no evidence of anything in the history or physical findings suggestive of syphilis I believe we can rule that out. I do not believe that any tumor that has recurred four times after surgical removal without a breaking down of the skin or without sinus formation can be tuberculous. Lymphosarcoma does occur in ribs, but lymphosarcoma of five years' duration would not leave so healthy an individual. Myeloma more commonly occurs in the older age group—the fourth or fifth decade, it is almost always a multiple tumor, and after five years the disease should be generally apparent. Giant-cell tumor of the rib is extremely rare. There is one case from this hospital in the Warren Museum, but I do not know of any other from this city. The few cases in the literature occurred at the end of the rib and presumably this had its origin in the midportion. Ewing's tumor occurs at this age. It does occur in ribs, but there is usually a history of trauma and almost always a story of pain, temperature and elevated white count. It is more likely to be confused with osteomyelitis, and often, even at operation, the differentiation of a Ewing's tumor and osteomyelitis is extremely difficult.

A tumor arising in the rib and recurring four times after local excision in a healthy young individual is most likely a chondroma or an osteochondroma. This type of tumor with time, and possibly with the trauma of multiple operations, is very likely to become malignant. It is the type of tumor that is likely to metastasize to the lung, and not infrequently the early metastases are solitary. I suppose this evidence of a lesion in the lung may have nothing to do with the original tumor, but I believe that this is probably a chondroma or an osteochondroma which has become malignant and has metastasized to the lung.

CLINICAL DISCUSSION

DR. CHANNING C. SIMMONS: I sent this young man into the hospital. The first four operations were done elsewhere. I did the last one, removing the entire rib. That is why Dr. Holmes cannot see the rib. The patient had routine x-ray films of the chest every three months, and the lesion in the lung was found. On reviewing the plate taken three months earlier one can see the same area very indistinctly, but it was not recognized at the time.

DR. EDWARD D. CHURCHILL: This is another tragic story of a chondrosarcoma of the rib originally treated by inadequate excision. These tumors are often spoken of as "benign." I consider them to be among the most treacherous tumors of the chest wall, and from our experience here, they must be treated as malignant tumors and the entire

rib in which they are situated must be removed at the first operation. The mistake is often made, or has been made in the past, that the surgeon tries to remove the tumor without opening the pleural cavity and with a margin of only 2 or 3 cm of the rib. We know that this is not adequate surgery, and the surgical results for this type of tumor, as reported in the literature, are notoriously bad. In this case we were presented with the diagnosis from the previous examinations, and the only question was whether it was worthwhile removing a metastasis. In this particular type of tumor I think it is justifiable to try to keep abreast with the metastases and the recurrences once they have started. So we did remove the lower lobe of the lung, a piece of the diaphragm that came in contact with the metastasis, and a section of the parietal pleura. I think the tumor will recur, but at least the operation has given him another span of a year or a few years until the recurrence takes place. I spoke of it as a tragic case, but the man had very little reaction to operation and was discharged from the hospital perfectly well.

A PHYSICIAN Was there any sign of local recurrence?

DR. CHURCHILL We did not explore that side.

DR. SIMMONS I agree with Dr. Churchill's remarks but should not want to limit them to chondromas of the rib, for I believe they apply to similar tumors of the other bones. I recall a case of a man of thirty-six, who in 1913 presented a chondroma of a metatarsal. A portion of the bone was removed and the tumor reported to be nonmalignant. Thirteen years later he returned with a recurrence, and the foot was amputated. He died a year later with lung metastases. In another case with multiple exostoses, Dr. Hugh Cabot performed a shoulder-joint amputation for sarcoma in 1902. In 1918 the femur was amputated for chondrosarcoma. Five years later the other femur was amputated, and he died three years later of acute appendicitis. This is not unusual in osteochondromas. The same thing happens in the os-

teochondromas of the pelvis, which are usually inoperable.

PREOPERATIVE DIAGNOSIS

Metastatic sarcoma of rib

DR. WALLACE'S DIAGNOSIS

Osteochondrosarcoma with metastasis to lung

ANATOMICAL DIAGNOSIS

Osteogenic sarcoma, chondroblastic type

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY It is difficult to know where to pin the responsibility for the improper treatment that these patients receive in most instances. Unquestionably both pathologists and surgeons are to blame, but I think that the trouble primarily is the failure of the pathologists and surgeons to understand each other. These chondromas of the ribs appear, from the histological point of view, as very benign tumors. It is almost impossible for the histologists looking at sections to imagine that they can be malignant and can metastasize. As a matter of fact, the majority do not metastasize in this initial stage of the disease. They have, however, an extreme tendency to implantation. It seems very probable that a single tumor cell implanted in a wound will give a recurrence, and I do not know of any other tumor in which implantation occurs with such frequency and regularity. Eventually, in the course of successive recurrences, frank malignancy may develop. In this case, inasmuch as the tumor found on the last entry was in the lung on the opposite side from where the original rib had been removed, there can be no question that we are dealing with a metastasis. The sections of the mass show a frankly malignant tumor, in part spindle-celled, in a few places showing a small amount of osteoid formation, we can call it osteogenic sarcoma in its present form.

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ATTEND THE ANNUAL MEETING!

The advance program of the annual meeting of the Massachusetts Medical Society has been sent to the fellows: the amended program was published in the *Journal* of last week. This document, the culmination of months of effort, warrants careful study as it offers to members a well-considered selection of entertainment as well as a résumé of much that is of importance in the progress of modern medicine.

Upon arrival at the Hotel Bradford, fellows will find adequate facilities for free parking. (Be sure to remove the green-cross sticker from your advance program and put it on your automobile windshield!)

The scientific exhibits located on the balcony of the Ballroom, offer sixteen different demonstra-

tions in the various fields of surgery, medicine, pathology, public health and radiology.

You are strongly urged to attend and examine the commercial exhibits. The annual meeting is an expensive affair. Fortunately for the Society, the cost does not fall entirely upon its members; if it did the meetings in their present form would be a luxury it could ill afford. The various manufacturers of drugs, medicines and equipment and the purveyors of services pertaining to the medical profession have found it worth while in certain instances to present their wares in the form of exhibits. These in many cases are extremely interesting, featuring displays of the newest articles as well as of time-tested products. It is well worth the members' time to examine each and every one. Most of our exhibits belong to the Medical Exhibitors Association. This organization keeps systematic records of the hundreds of medical meetings that are held throughout the country each year, and on the basis of its analysis is based the decision as to which meetings its members should attend. A good rating with their association is desirable, and can be obtained if fellows will register at the various booths. Our standing has not always been of the best. Possibly our New England attitude of indifference has kept us from showing more interest in these displays. We believe that a visit to each of the commercial booths will not only repay the physician but be a great aid toward making prosperous meetings in the future.

The combined clinical meeting proved to be a great success at its annual appearance in 1957. It should command even greater attention this year for it not only offers subjects of practical and general interest to all branches of the profession in one continuous meeting but presents papers or clinics by members of the staffs of twelve Boston hospitals—an increase by two over last year. Study of the past programs of other medical societies discloses the fact that this type of meeting is gaining increasing popularity throughout the country. In our own society, the members must soon express their opinion for the guidance of the Committee of Arrangements as to the role of

rib in which they are situated must be removed at the first operation. The mistake is often made, or has been made in the past, that the surgeon tries to remove the tumor without opening the pleural cavity and with a margin of only 2 or 3 cm of the rib. We know that this is not adequate surgery, and the surgical results for this type of tumor, as reported in the literature, are notoriously bad. In this case we were presented with the diagnosis from the previous examinations, and the only question was whether it was worthwhile removing a metastasis. In this particular type of tumor I think it is justifiable to try to keep abreast with the metastases and the recurrences once they have started. So we did remove the lower lobe of the lung, a piece of the diaphragm that came in contact with the metastasis, and a section of the parietal pleura. I think the tumor will recur, but at least the operation has given him another span of a year or a few years until the recurrence takes place. I spoke of it as a tragic case, but the man had very little reaction to operation and was discharged from the hospital perfectly well.

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world as a model and its catalogue, first published in 1879 and issued ever since that date, has been described as "America's greatest gift to medicine. Rare must be the physician in this country who pretends in any way to keep abreast of medical thought, who, in some way, does not come in contact with this great institution. The Army Medical Museum, which is closely associated with the library, preserves for the benefit of physicians the largest pathological collection in America. Seven registries of pathology have been established at the museum by national scientific societies since the World War. The Army Medical Library and Museum, therefore, offer a unique opportunity to investigators to study the entire literature on a medical subject and then to view the pathological specimens, gross and microscopic, of the subject under consideration.

It will be a great pleasure for physicians to learn that the President of the United States has approved the project of constructing a suitable building to house these priceless collections and that a bill is before Congress proposing the construction of such a building in Washington. For the first time, therefore, a project which has long been in the minds of many of our leading physicians now has a definite plan. This proposal should receive the hearty endorsement of the medical profession and a letter to the congressional representative of any physician, urging the passage of this bill during the present session of Congress, if written promptly, would serve to emphasize our desire to see the Army Medical Library and Museum properly housed.

MASSACHUSETTS MEDICAL SOCIETY

SUGGESTED REVISION OF BY-LAWS

The majority of the committee appointed by the Council at its meeting on February 2, 1938, to consider suitable changes in the by-laws designed to clarify the method by which delegates to the annual meeting of the American Medical Association shall be chosen wishes to make it clear that nothing in its recommended amendment of Chapter IV, Section 7, as printed in the notice

recently mailed to all fellows of the Society, precludes nominations from the floor.

HALBERT G. STETSON, *Chairman*

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No. 73 SEPARATION OF THE PLACENTA

A twenty-two-year-old primipara, due August 23, 1931, entered the hospital August 10, with a history of having had intermittent uterine contractions throughout the day of entry, with the onset of vaginal bleeding one hour prior to entry. At this time the uterine pain became more severe and continuous. The patient was unable to estimate the amount of blood she had lost.

There was no family history recorded, and the patient's past history was not remarkable. Catamenia began at fourteen, had a twenty-eight-day cycle, were regular and lasted four to five days, there was no pain. Her last period was November 16, 1930.

Her antepartum course had been uneventful. She had been followed four and a half months in the prenatal clinic, and at no time had shown hypertension or albuminuria, for the three or four days prior to entry she had felt "nervous." The last visit to the clinic was six days prior to entry.

On physical examination at entry, the patient was a well-developed and nourished woman, crying with pain and apparently very uncomfortable. The skin and mucous membranes were very pale. The blood pressure was 96 systolic, 90 diastolic, with a pulse of 120, which was easily compressible and difficult to obtain. Abdominal examination revealed an eight-months-pregnant uterus, which was tense and rigid. The fetal heart was not heard. A perineal pad worn on admission was soaked with bright-red blood. Vaginal examination revealed the cervix to be partially taken up, the os one finger dilated, and the head in the midpelvis. Thirty cubic centimeters of urine obtained on admission showed a trace of albumin and a few white blood cells.

One-half hour after entry the cervix and vagina were tightly packed with 9 yd. of gauze, following which a Spanish windlass was applied. One minim of pituitary extract was given following these procedures. Intravenous fluids were also started, and

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

the combined clinical meeting in the annual sessions. Shall it be enlarged in scope to extend through two days, thereby cutting down upon the length of the programs of the various section meetings? Or shall it be rearranged to absorb the section meetings—the latter to be run in tandem with short periods for executive sessions and the election of officers? It is hoped that these possibilities, with perhaps other suggestions, will be considered and discussed in the coming section meetings.

In the matter of guest speakers, the Society is indeed fortunate. Dr. David Riesman, of Philadelphia, emeritus professor of clinical medicine and professor of the history of medicine at the University of Pennsylvania School of Medicine, will give the Shattuck Lecture. His subject is "America's Contribution to Nosography." On the same evening, Surgeon General Thomas Parran, of Washington, District of Columbia, will talk on the work and aims of the United States Public Health Service. For the annual dinner, President Frothingham has been able to secure Mr. Norman MacDonald, executive director of the Massachusetts Federation of Taxpayers' Associations, who will take as his subject, "Tax Problems in Massachusetts: the Obligation of Citizens, Professional and Otherwise, to Do Something about It." We know of no one better qualified to present this interesting and important problem. All who went to the Springfield meeting two years ago will remember with pleasure Dr. Allen S. Rice, visiting surgeon at the Springfield Hospital. He will present the annual oration—a discourse on "The Passing of Surgical Yeomen."

The Ladies' Committee has completed its interesting program for the wives of members. An original feature will be a private dinner party given on the first evening at the Hofbrau House, where our Teutonic hosts will entertain their guests with German songs and dances. Those who have not already done so are urged to send in their acceptances immediately, for the number of tickets is limited.

No one should attend the annual meeting without making at least one visit to the exhibition of

the Boston Physicians' Art Society. It will be stimulating to discover what remarkable work one's busy contemporaries are doing with the spare time which the rest of us find so difficult to turn into creative channels.

Special attention is again called to the golf tournament to be held on Wednesday afternoon, June 1, at the Commonwealth Country Club, 91 Algonquin Road, Newton Centre. Members both with and without club or state handicaps will have their respective divisions and will find an added attraction in the numerous prizes in each group. The Massachusetts Medical Society Golf Challenge Cup, a ten-inch, sterling-silver, Paul Revere bowl, will be awarded for the low net score. Each player should have every inducement to attempt to win this bowl three different years, for this is necessary to make it a permanent part of one's display of trophies. It is hoped that the golf tournament will become an increasingly popular fixture in our spring sessions. Send in your entry now and bring your clubs with you!

Students of the progress of our society, the oldest in continuous operation in the United States, will observe that, year by year, its annual gatherings offer more and more to its fellows. There is every reason to believe that the coming annual meeting will surpass its predecessors in the fields of interest, instruction and entertainment. One must keep in mind, however, that the success of any such venture depends not alone upon the physical equipment but in even larger measure upon the enthusiasm of the members themselves. This enthusiasm is exemplified by a large attendance.

NEW BUILDING FOR THE ARMY MEDICAL LIBRARY AND MUSEUM

THE affairs of the Army Medical Library, which has recently celebrated its centenary, having been established by the Surgeon General of the Army in 1836, are of interest to all physicians. The largest medical library in the world, with its material, except for the rarest books and manuscripts, available to every practicing physician, this library is regarded everywhere throughout the

The cause of death in this disease is due to paralysis of the muscles of respiration. Many lives have been saved, however, in the last few years by the use of respirators. This is a machine devised to keep up artificial breathing indefinitely. Some patients have been kept alive for months by the use of this machine, and then gradually they are able to breathe properly without it.

The treatment after the acute stage is of extreme importance and has two objects, first, to prevent the development of the deformities which are liable to occur and secondly, to bring back power to the paralyzed or weakened muscles. Most of the deformities may be prevented if the patients come under treatment immediately after the onset. This means the application of light splints or plasters to hold the limbs in their normal positions to prevent the contraction of normal muscles when unopposed by the weakened ones.

The bringing back of power to muscles weakened by this disease is a long and tedious process. In the case of certain muscles, where the nerve centers have been completely destroyed, no power can ever be regained. A great deal of improvement can be made, however, in weakened muscles where the nerve supply is only partially destroyed. By prolonged treatment many muscles make a complete recovery of their powers to function.

An important aid to muscle training, which is usually given on an examination table, is what is called under water treatment, or treatment in a tank or pool. Under water treatment is a very pleasant way of carrying out the prescribed muscle exercises. The buoyancy of the water allows the patients to carry out movements more easily than on a table without the aid of water. In this treatment very carefully supervised exercises must be given, and it must be borne in mind that it does not consist merely of putting the patient in the water simply to swim and splash around. The patients must be carefully watched so that they will not overuse the stronger muscles and increase any deformity already present.

Parents should see to it that in the early stages their children receive proper attention and are not neglected until deformity occurs. It is much easier to prevent an early deformity than to correct it later. We see many patients with terrible deformities, the legs drawn up to the body, with bad curves of the spine, and some even crawling about on all fours, due really to neglect, the parents believing that nothing can be done for these pitiable children. Patients paralyzed for many years can be greatly benefited by proper treatment. The idea that nothing can be done for cripples of long standing is entirely wrong.

As the treatment for this disease is such a slow one, parents are apt to become discouraged. They will be advised to do this or that, and will receive pamphlets from charlatans promising cures. There is no quick cure, and no honest physician can or will promise one.

Based on the observation of over 6200 cases of infantile paralysis, it can be said (1) between 35 and 40 per cent of all cases become normal, (2) deformities can and should be prevented by proper treatment, (3) practically every case can be made to walk, although some will require braces and crutches, and (4) with proper treatment and suitable vocational training, no victim of infantile paralysis should become a public charge.

Q How is this disease contracted?

A. The disease is caused by a kind of germ which is called a filterable virus. This is apparently spread by ordinary contact, probably in much the same manner as the virus of measles. Only a very small minority of those who are exposed to the virus develop symptoms character-

istic of the disease. Whether or not paralysis develops may depend upon the inherent resistance of the individual to the virus. But the nature of these factors of resistance is yet unknown.

Q How much permanent paralysis will my child have?

A. About 50 per cent of patients who develop the characteristic early symptoms do not develop paralysis at all, and about 50 per cent of those who develop paralysis recover entirely. None of the symptoms in the early stage of the disease make possible a prediction as to the amount of permanent paralysis. This depends on the amount and degree of nerve-cell impairment in the acute stage of the disease.

Q After the disease has started, is there anything to be done that can prevent later paralysis?

A. That is what we are trying to find out by research. We are hoping to discover some means of stopping the action of the virus before it has injured the nerve cells.

Q How can deformities be prevented?

A. By early treatment of the affected muscles. This is accomplished by the application of light splints or plasters to the affected parts to keep them in their normal positions, followed later—when sensitiveness has subsided—by muscle re-education.

Q When a child's leg muscles are affected, why not let him run around for his exercises?

A. Because by doing this he will tire the already weakened muscles and strengthen the normal ones, thus causing deformities.

Q Why do you operate on these cases?

A. To correct existing deformities, to change unstable joints into stable ones, and to transplant strong tendons or muscles to take up the work of the paralyzed or weakened ones in order to give the patient a better balance of muscle power.

NEW HAMPSHIRE MEDICAL SOCIETY

HISTORICAL

The records of the New Hampshire Medical Society, dealing with each annual meeting, contain much that is of interest to the student of New Hampshire medicine. In 1827, for instance, we are told that Drs. Thomas Chadbourne and Josiah Crosby resigned because the Society did not enforce the regulation relating to consultation with irregular practitioners. After listening to a report on the subject by Dr. Oliver, those present refused to accept the resignations, because the petition contained unproved charges against the Society and certain particular members. The report contains a remarkably able and cogent argument against leaving an organization to reform alleged irregularities in it.

At this same meeting a dissertation on fractures, presented by Dr. Luke Howe, was nearly completed when the landlord appeared and notified the Society to find accommodations elsewhere. It was adjourned to the court house. This summary conduct on the part of the host is thought to have been due, though the record is silent on this point, to the uncompromising attitude of the Society on the use of alcohol.

BOARD OF REGISTRATION IN MEDICINE

A special meeting of the New Hampshire Board of Registration in Medicine, for the licensing of candidates

soon thereafter she began to bleed through the vaginal pack. Two transfusions of 500 cc of citrated blood were given, because of a rapid, poor pulse of 132, air hunger, thirst and other evidences of blood loss, although the blood pressure was 150 systolic, 130 diastolic. Vaginal bleeding stopped after the second transfusion. Pituitary extract was continued in increasing doses up to 4 min every half hour. Restlessness was controlled by two doses of morphine (1/4 and 1/6 gr). The patient went into labor about three hours later and gradually pushed out the vaginal pack. Eleven and a half hours after entry, under gas-oxygen anesthesia, she was delivered normally of a dead, but not macerated, full term, male infant. The blood loss at delivery was 325 cc.

At delivery only 30 cc of urine was obtained, which also showed a trace of albumin. Because of the oliguria the patient was put on constant drainage so as to follow the urinary output more accurately. Immediately after delivery the patient was given 150 gm of glucose in 500 cc of saline, in an attempt to stimulate urinary output.

Following delivery the patient's condition was improved. There is no record of the blood pressure immediately after delivery, but at the end of the day it was 100 systolic, 76 diastolic. During the puerperium the urinary output increased, the amount of albumin decreased, and the blood pressure gradually fell to normal, being 110 systolic, 86 diastolic, at discharge.

Blood studies on August 12 showed a nonprotein nitrogen of 50 mg, a urea nitrogen of 22.5 mg and a uric acid of 70 mg per cent. These values all decreased during the puerperium. On August 15 the nonprotein nitrogen was 32 mg and the uric acid 51 mg per cent, and on August 22 they were 48 mg and 5.3 mg respectively. The postpartum course was uneventful, and she was discharged well on the fourteenth day.

The placenta weighed 320 gm. There was a 2-cm area of old hemorrhage into the placenta with resultant necrosis of the surrounding tissue, including the associated decidua, over an area 9 by 4 cm. The old necrosis of the decidua had resulted in a massive, recent hemorrhage covering half the maternal surface of the placenta to a depth of 1 to 4 cm. The latter was the pathologic lesion associated with the vaginal bleeding on entrance, but the older hemorrhage causing the infarction, which in turn was responsible for the recent hemorrhage, occurred some days prior to the onset of the patient's acute illness.

Comment. This is a typical history of toxic separation of a normally situated placenta and shows how quickly separation can take place. She visited the clinic six days prior to entry and was

normal in all respects. The success of the conservative treatment for this condition is again evidenced. When the baby is dead and when the patient is in shock it is almost never advisable to do anything but treat the case in this conservative manner. The quick recovery to normal of blood constituents, urine and blood pressure points to a complete recovery. Time alone, however, will prove whether lasting kidney damage exists.

INFANTILE PARALYSIS

The victims of poliomyelitis, more commonly called infantile paralysis, are a common sight to us all.

Not many years ago the very mention of the name, infantile paralysis, struck terror to the hearts of parents. This fear that their children may catch the disease still exists, but parents today need not have the dread that their children, so afflicted, will become hopeless cripples, a constant care or a great expense to themselves or the community.

If the disease is recognized early and if prompt and effective treatment be given, none of the terrible deformities we have been accustomed to see need occur. It is only by the early prevention of beginning deformities that this may be brought about.

Infantile paralysis is caused by an infection which damages that part of the spinal cord containing the nerve cells which control muscles in all parts of the body and which make them contract and thus produce movement. This damage may weaken or completely paralyze the muscles affected.

The disease is most common in children under twelve, but persons of all ages may be affected. The majority of cases occur in late summer or early fall, generally from August to November, but cases are reported throughout the year.

The symptoms at the onset vary a great deal. At the beginning the child perhaps may not be so active or want to play with other children. He may complain of a sore throat, a mild digestive upset, or pain in the abdomen, legs or arms. He is very sure to have a slight rise in temperature and to complain of headache, and will be found unwilling to bend forward to put his head between his knees, on account of stiffness of the neck and back. It is most important for parents whose children show any of these symptoms, especially stiffness of the neck or back, to consult their family physician at once. If he suspects infantile paralysis, the Massachusetts Department of Public Health will always send a doctor to verify the diagnosis.

The paralysis or weakness takes place generally in from twenty-four to forty-eight hours after the first symptoms are noticed. At this time, or as early as the first symptoms are seen, pain of varying severity is usually present in the arms or legs and sometimes in both.

You have seen a great deal in the papers about the use of serum in the treatment of infantile paralysis to lessen or prevent the paralysis. The use of serum was based on experimental evidence that serum of patients who had recovered from the disease, called immune serum, would destroy the germ in other patients. While a few years ago we were very hopeful that this procedure might be of great help in the treatment, we have, I am sorry to say, no proof that it is of any benefit.

A Green Light to Health broadcast given by Dr. Arthur T. Legg on Wednesday May 11 and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

moving frequently Tuberculosis is their major health hazard. While the white tuberculosis death rate in Hartford has been declining, that of Negroes has remained as high as it was twenty years ago Syphilis is a leading cause of illness and death and is one of the major causes of heart disease. The heart-disease death rate of Negroes in Hartford during 1937 was almost double that of the white population. The infant mortality rate in Negroes was over two and a half times that of the white population.

ADDITION TO UNDERCLIFF SANATORIUM

Plans have been made public for a new \$600,000 infirmary, school and administration building of brick and concrete for Undercliff Tuberculosis Sanatorium at Meriden. The new structure will provide a 200-bed infirmary with expansion room on porches, modern facilities for children from three months to eighteen years old and equipment which will make it one of the finest in the country. The building has been designed to conform with the modern needs of tuberculosis sanatoriums.

HARTFORD COUNTY MEDICAL ASSOCIATION

Dr James R. Miller has been elected president of the Hartford County Medical Association succeeding Dr Maurice T. Root. Dr Henry Costello, Hartford's medical examiner, has been elected vice president, Dr Frank T. Oberg re-elected secretary treasurer and Dr Root made a member of the Board of Censors. Dr Benjamin Robbins has been elected to membership on the Committee on Public Policy and Legislation. New state delegates who are also members of the Board of Directors, are Dr James M. Lynch, Dr Peter J. Steincrohn, Dr Edwin C. Higgins, Dr Aaron P. Pratt and Dr Charles T. Schechtman.

Dr Root's address as retiring president was entitled "An Everyday Approach to Some Pressing Medical Problems." The guest speaker, Dr Charles H. Goodrich, president of the Medical Society of the State of New York, discussed "Public Health and Preventive Medicine in Private Practice."

CONSTRUCTION AT FAIRFIELD STATE HOSPITAL

Plans have been announced for two continued treatment buildings for the Fairfield State Hospital at Newtown, each building to have a rated patient capacity of 420. In the previous building program of the institution a Reception Hospital for the treatment of early acute cases was provided; there was also constructed a General Hospital for the care of the strictly medical and surgical cases. The units now to be constructed, one for either sex, are for the care of well-adjusted patients requiring prolonged or indefinite hospitalization, but who, in general, are able bodied and require, in relation to other patients, a lesser amount of medical, psychiatric and nursing care.

MEDICAL INFORMATION BUREAU MEETING

On April 13 at a meeting in Hartford sponsored by the Medical Information Bureau, Dr Herman Lande, of Mt. Sinai Hospital, New York, presented the plan for a paid diagnostic clinic as it now operates in New York City. The clinic was established in 1930, is maintained for the benefit of persons whose combined family income is not above \$4000 annually, and returns to the staff physicians half the payments received. The clinic is now taxed to its capacity.

NEW ENGLAND SOCIETY OF PSYCHIATRY

The New England Society of Psychiatry held its annual meeting April 26 at the Neuro-Psychiatric Institute of the Hartford Retreat. Dr Louis H. Cohen, of the Research Service, Worcester State Hospital, gave the principal paper on "The Treatment of Schizophrenia with Metrazol." Dr Harlan L. Paine, of the Grafton (Massachusetts) State Hospital, was elected president of the society. The meeting was well attended by prominent psychiatrists from New England, New York and the District of Columbia.

CONNECTICUT SOCIETY FOR MENTAL HYGIENE

The thirtieth anniversary of the Connecticut Society for Mental Hygiene, originator of activities that have become national and international, was celebrated in New Haven on May 5 and 6. The program included a founders dinner at the Faculty Club, formerly the home of Prof. Anson P. Stokes, where the society was formed.

DEATHS

SELLECK—NATHANIEL SELLECK, M.D., for twenty years president of the Danbury Board of Education, died in that city on March 13. Dr Selleck was born in Danbury, November 2, 1868, and had been a lifelong resident of that place. He was graduated from the Medical Division of the University of the City of New York in 1891, and went to Danbury where he had practiced until his final illness. He was prominent in community affairs and was actively interested in politics. On more than one occasion he was considered as Democratic nominee for mayor, but always declined. He was a member of the staff of the Danbury Hospital and senior member of the medical staff. He was a member of the Danbury Medical Society and the Fairfield County Medical Association. He was a 32nd degree Mason, and also a member of Pyramid Temple, Mystic Shrine, and of Danbury Lodge of Elks. He is survived by his widow, a son, Dr. Nathaniel B. Selleck, and two grandsons.

ELLIOTT—CALVIN H. ELLIOTT, M.D., of Hartford, died March 15 in Tucson, Arizona, where he had been staying since late in December. Dr Elliott had been a member of the Hartford Hospital staff since 1916 and was consulting gynecologist and obstetrician for many hospitals around Hartford. He was a graduate of Bucknell University and of Jefferson Medical School. About fifteen years ago Dr Elliott received a life saving medal from the American Red Cross for a daring piece of rescue work accomplished at North Truro, Massachusetts. He was a member of the American and Hartford County medical associations, the Hartford and Connecticut State medical societies and the New England Obstetrical and Gynecological Society. He was also a fellow of the American College of Surgeons and a member of the Wadsworth Atheneum, the Hartford Golf Club, Sphinx Temple, Mystic Shrine, and the Hartford Rotary Club. He is survived by his widow, a daughter, Marie Luise, and a son, Calvin H., Jr.

NETTLETON—FRANCIS I. NETTLETON, M.D., health officer and former mayor of Shelton for ten years, died March 19, after an illness dating from last November. A native of Shelton, he was born October 23, 1874, the son of Charles O. and Frances Hallock Nettleton. He was graduated from the Sheffield School of Science in 1894, then entered Yale School of Medicine and was graduated in

by examination and by reciprocity, will be held at the State House, Concord, at 10 a. m. on June 15 and 16. Candidates should apply to the secretary, Dr. Fred E. Clow, Brown House, Wolfeboro.

SOCIETY MEETINGS

Dr. Dwight O'Hara, assistant dean of Tufts College Medical School, was the guest speaker at the Dover Medical Society on May 5. His subject was "Scarlet Fever and Streptococci."

A meeting of the Strafford County Medical Society was held at Rochester on April 27. Drs. Roscoe G. Blanchard, Louis W. Flanders, John H. Bates and Forrest L. Keay, active members of many years standing, were made honorary members of the society. Dr. Andrew J. Oberlander, Durham, University of New Hampshire medical director, was elected to membership. Dr. Samuel F. Marshall, of Boston, read a paper entitled "The Acute Abdomen."

A combined session of the Hillsboro County Medical Society and the New Hampshire Surgical Club in its forty-first annual convention was held at Nashua on April 26. Operative clinics were conducted by Drs. Halsey B. Loder, George Smith, Gordon M. Morrison and Frank H. Baehr. Drs. Ezra Jones, Harold G. Lee and George Smith participated in a symposium on "Low-Back Pain," after the business meeting at the Nashua Country Club.

Hon. Frank J. Sulloway and Drs. Sven Gundersen and E. L. Levine took part in the program at the recent annual meeting of the Rockingham County Medical Society at Portsmouth. Dr. Ralph Barker presided at the sessions. Dr. James Sanders illustrated his talk on "Traumatic Injuries of the Extremities" with moving pictures.

A meeting of the Belknap County Medical Society was held at the New Hampton School on April 5. Dr. M. Alice Normandin presided and the guest speaker, Dr. Halsey B. Loder, of Boston, read a paper entitled "Emergency Treatment of Conditions That Arise in General Practice."

DEATHS

BADGER—MELVIN P. BADGER, M.D., of Manchester, died Saturday, April 23, at the age of fifty-one. During the World War he served for two years in France as a captain in the Medical Corps. He was prominent in the veterans organizations of Manchester and a member of the medical staff of the Notre Dame Hospital.

He is survived by a son, Melvin E. Badger, of Manchester, and two sisters, Mrs. Martha A. Smith and Mrs. Libbie M. Cummings, both of Boston.

DRAKE—CHARLES B. DRAKE, M.D., died from pneumonia at his home in West Lebanon on April 2. He was born in St. Johnsbury, Vermont, on August 19, 1848, to Spencer and Abigail (Keith) Drake. For fifty years he had been in active practice in West Lebanon and vicinity, retiring several years ago because of ill health.

He had served on the Board of Education and the State Board of Health and represented the town of Lebanon in the New Hampshire General Court for more than six terms. He had also been school physician in West Lebanon. In 1933 he was honored by the New Hampshire Medical Society for his fifty years of active practice.

PERSONALS

Dr. Benjamin W. Baker, superintendent of the Laconia State School, was a delegate to the meeting of the American Association on Mental Deficiency at Richmond, Virginia, the last week of April. Dr. Baker led a discussion of the relation of mental deficiency to medicine and presided over a session of the convention. He is a member of the Public Relations Committee and of the Nominating Committee.

Certificates of the American Board of Internal Medicine have been granted to Drs. Fred E. Clow, of Wolfeboro, and Robert B. Kerr, of Manchester.

Dr. Frank S. Lovering, Moultonboro, who was ill for several weeks, has resumed practice.

Dr. W. J. Paul Dye has returned from a recent vacation in West Virginia.

Dr. Kenneth E. Dore, formerly of New Hampshire, has opened an office for the practice of medicine at Fryeburg, Maine.

NOTE

Mrs. Harry Almond, of Rochester, was elected president of the Women's Auxiliary to the Strafford County Medical Society. At its recent meeting Dr. L. W. Flanders was the guest speaker. Other officers elected were Mrs. Harold Adams, of Somersworth, vice president, Mrs. Louis Collin, of Dover, secretary, Mrs. Joseph MacLaughlin, of Farmington, treasurer, and Mrs. J. J. Morin, of Rochester, auditor. Mrs. J. J. Topham, president of the state organization, was a guest.

MISCELLANY

CONNECTICUT NEWS

MORTALITY IN CONNECTICUT FOR THE PERIOD, 1933-1937

The year 1937 established a record low death rate of 9.9 per 1000 population of Connecticut residents dying within the borders of the State. Records were made during the five-year period by an infant mortality rate of 40.5 per 1000 live births, by a rate for all forms of tuberculosis of 36.8 per 100,000, by one of 1.6 per 100,000 for diarrhea under two years of age, and by a maternal mortality rate of 2.9 per 1000 living births.

CLINICS FOR CRIPPLED CHILDREN

Diagnostic clinics for crippled children have been started at each of the five centers in the State. Eighty-four patients were examined at the five clinics, half of them being nine years of age or under. Sixty-eight of the 84 were found to be eligible for care by the Division of Crippled Children, State Department of Health.

NEGRO HEALTH PROBLEMS IN HARTFORD

By increasing the Board of Health budget from \$97,360 to \$131,040 for the fiscal year beginning April 1, 1937, and by the addition of state funds it has been possible to reorganize the activities of the Board of Health and give special consideration to negro health problems. The average length of life of Hartford's white residents is approximately sixteen years longer than that of the negro residents. The 1937 white death rate was 9.77 per 100,000, while that of Negroes was 17.41. The Negroes do not take advantage of the health facilities now available, many are transients,

Lobar pneumonia, pulmonary tuberculosis, mumps and tuberculosis (other forms) were reported above the five year average.

The incidence of diphtheria was considerably below the five year average.

Typhoid fever continued to show low incidence

The incidences of German measles, measles, whooping cough and meningococcus meningitis were below the five year average.

Paratyphoid fever continued to be reported from several points throughout the State.

The incidence of undulant fever was not remarkable

The reported incidence of dog bite showed a considerable increase since last month. Several cases of animal rabies were reported throughout the State. A new focus was noted in Worcester. Older foci in Cambridge, Rowley and Stoughton were active.

NEW FILM ON TUBERCULOSIS

Four authorities on tuberculosis do the talking in the National Tuberculosis Association's new medical film "Diagnostic Procedure in Tuberculosis," which will be released early in the summer.

The film, which lasts twenty five minutes will be shown by local tuberculosis associations throughout the United States before medical and health groups. It is the first movie of its kind in sound produced by the National Tuberculosis Association.

The doctors who participate in the film are Dr. Kendall Emerson, managing director of the National Tuberculosis Association, New York City, Dr. Ralph S. Muckenfuss, director of the Bureau of Laboratories, New York City Department of Health, Dr. Esmond R. Long, director of the Henry Phipps Institute, Philadelphia, and Dr. Edgar Mayer, assistant professor of medicine, Cornell University Medical College, New York.

Dr. Emerson is the narrator and in his introductory remarks says: "In the front line of the fight against tuberculosis is the general practitioner. He sees the patient first and upon his skill and judgment depends the patient's future. The greatest service he can render is to make the diagnosis correctly and without delay. There are certain diagnostic procedures every general practitioner is capable of carrying out. Dr. Emerson then introduces the speakers."

Dr. Muckenfuss demonstrates a simple technic of sputum examination. The making and reading of the tuberculin test are explained by Dr. Long. Dr. Mayer explains the x-ray as a means of diagnosing tuberculosis and the fundamental facts of x-ray interpretation.

ANNUAL PRIZE SUBSCRIPTION

The annual prize subscription offered by the *New England Journal of Medicine* for the best undergraduate contribution to the *Tufts College Medical Journal* has been awarded for the current year to Bromislaus A. Guluska, M. 39. His paper "Trichinosis" was published in the January, 1938, issue.

NOTE

At the recent annual meeting of the Harvey Cushing Society in Memphis, Tennessee, Dr. Louise Eisenhardt, of New Haven, was elected president and Dr. William J. German, of New Haven, secretary. The next annual meet-

CORRESPONDENCE

PUBLIC-HEALTH ADMINISTRATION

To the Editor: In view of recent events at the State House, it may be of interest to recall some of the things leading to the reorganization of the old Board of Health into the present Department of Public Health.

The late Edward F. McSweeney was the first active factor in the change. In his work at Ellis Island, he had come in contact with men of the United States Public Health Service and had become profoundly impressed with their earnestness and vision, and their disinterested desire to care for the health of the people of the United States. He had been particularly impressed with the work and ability of Dr. Victor Heiser, now known to many as the author of *An American Doctor's Odyssey*.

Mr. McSweeney entertained Governor Walsh at his summer camp one week-end, and called his attention to the fact that Dr. Walcott's term would expire and that the Governor would be called upon to make a new appointment. He talked about public health throughout the whole week-end, and Governor Walsh was well prepared when Dr. Walcott told him that because of his age he could not accept a reappointment and told him about public health duties. He also understood, when Dr. Enos H. Bigelow, a representative at the State House, offered his assistance in any attempt at reorganization of the Board of Health, for which a number of petitions had been presented to the legislature. And in a message to the legislature the Governor recommended that there should be a reorganization of the Board of Health.

The year previous, the State of New York had reorganized its Department of Public Health, a bill with very elaborate details having been passed by the New York legislature. On a trip to New York, the writer interviewed both Dr. Herman Biggs, who had been made commissioner, and Homer Folks, who had been largely instrumental in securing the passage of the bill. They both were satisfied with the bill as it had been enacted, and had no important amendments to offer. With this report and a copy of the bill, the committee of the Massachusetts Medical Society had the basis for drawing a bill adapted to the needs of Massachusetts.

An official group of physicians specially interested in public-health matters held a meeting, which Dr. Walcott was invited to attend and state his ideas as to a reorganization of his board. He accepted the invitation but presented no really constructive ideas. While the good work that he had accomplished in the long years as chairman of the board was deeply appreciated, those at the meeting were disappointed to receive no forward looking message of guidance. However, a committee was appointed to try and draw up a bill to present to the legislature.

This committee met, considered the New York bill with its commissioner, district health officers, Department of Communicable Diseases, and so forth, and instructed one of its members to put the various suggestions into proper form. When this was done, and the bill had the approval of Governor Walsh,—it contained several of his personal suggestions,—it was introduced into the legislature by Dr. Bigelow.

Meantime, Mr. McSweeney made the suggestion that the Governor should get the promise of Dr. Heiser, then in the Philippines, that he would accept the position of commissioner should the bill become a law. Receiving a favorable answer, Governor Walsh went to a meeting of the Council of the Massachusetts Medical Society, gave his approval of the bill, and solemnly promised that he, on

1897 After a year as intern in Backus Hospital, Norwich, he began his practice in Shelton. He was a member of various Masonic groups, including Knights Templar and Mystic Shrine, and was also affiliated with the Connecticut State Medical Society and the New Haven and Fairfield County medical societies

STILLMAN—CHARLES K. STILLMAN, M.D., prominent in civic affairs, died in Mystic on March 22. Born July 15, 1879, in Plainfield, New Jersey, he was the son of the late Dr. Charles F. Stillman and Harriet Greenman Stillman, who survives him. His grandparents were prominent shipbuilders. Because of a difference between his parents when he was a boy, his father put him in the Cheltenham Military School in Pennsylvania, from which he was graduated in 1896. Returning then to his mother's custody, he went to Brown, was graduated in 1900 and went to Columbia Medical School, graduating in 1904. He interned at Bellevue Hospital and practiced in New York City several years. About twenty years ago he returned to Mystic where he practiced until ill health caused his retirement. Dr. Stillman was a lieutenant during the World War, stationed at Camp Wheeler in Georgia. He was a member of the Mystic Hook and Ladder Company, the Southern New England Fishermen's Association, and an organizer and officer of the Mystic Marine Historical Society.

HOLMES—LE VERNE HOLMES, M.D., chief orthopedic surgeon at Manchester Memorial Hospital, died suddenly of coronary thrombosis at the home of his daughter, Mrs. John Sinkinson, of Scarsdale, New York, he was in his fifty-ninth year. Dr. Holmes had been attending a conference and clinic of the College of Surgeons in New York City and was scheduled to return home the next day. Dr. Holmes was made medical examiner in April, 1935, and prior to that was assistant medical examiner for fifteen years. A native of Richmondville, New York, Dr. Holmes saw service in the Spanish American and the World wars. In the latter conflict, he was a lieutenant in the medical corps, specializing in orthopedic surgery. At the time of his death, he held a rank of lieutenant colonel, Medical Reserve Corps, 76th Division. He joined the hospital staff in Manchester on its opening in 1920 and on January 1, 1923, was placed in charge of the orthopedic service. Prior to that he served as school physician. Following graduation from Boston University School of Medicine in 1904, he served an internship at the Massachusetts Homeopathic Hospital, Boston, and began private practice in Arlington, Massachusetts. He went to Manchester in 1910 and, with the exception of his service in the World War, had practiced there since that time. He was vice president of the attending staff of physicians at the hospital and was secretary treasurer of the Manchester Medical Association. Prominent in civic affairs, he was vice president of the Y. M. C. A., president of the Manchester Country Club and a member of the Chamber of Commerce. He was a member of the Manchester Lodge of Masons, the Odd Fellows, and the Dilworth-Cornell Post, A. L. He was also a member of the Hartford County and Connecticut State medical societies and the American Medical Association. Besides his daughter, he is survived by his widow, Mrs. Ruth C. (Wiswall) Holmes, his father, Reuben Holmes, of Blenheim, New York, and a brother, Lindsay Holmes, of Cedar Falls, Iowa.

RING—HENRY W. RING, M.D., prominent retired eye and ear specialist and a former ophthalmologist at Yale University, died on April 3 at New Haven at the age of eighty-one. He was a native of Portland, Maine, and was

graduated from Bowdoin College in the class of 1879 and from Bowdoin Medical School in 1887. After starting practice in New Haven in 1889, Dr. Ring became acting and consulting ophthalmologist at the New Haven Hospital and secretary of the Board of Directors. He retired in 1925 and for the next ten years was ophthalmologist in the Department of Health at Yale. He was responsible for passage of a law in Connecticut for prevention of blindness of the new born. Dr. Ring was a former president of the New York Ophthalmological Society.

KELLY—JAMES F. KELLY, M.D., physician and pathologist, died at St. Francis Hospital, April 3, of injuries received in a fall at his home less than an hour earlier, he was thirty-one years old. He had opened his practice only a little more than a year ago. A native of Hartford, Dr. Kelly was graduated from Trinity College in 1929 and from Yale Medical School in 1933. He served his internship at the Meriden Hospital and at St. Francis Hospital. Following special training in pathology in Toronto, Canada, he began practicing in Hartford in January, 1937. Dr. Kelly was a member of the Hartford Medical Society, the Hartford County Medical Association and the Connecticut State Medical Society. He was not married. He was the son of Mrs. Mary Callahan Kelly, of Hartford, and the late James J. Kelly. Besides his mother, he is survived by a sister, Miss Ruth M. Kelly, of Hartford.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR APRIL, 1938

DISEASES	APRIL 1938	APRIL 1937	FIVE YEAR AVERAGE*
Anterior poliomyelitis	0	0	1
Chickenpox	1301	1493	1136
Diphtheria	16	11	39
Dog bite	964	990	845
German measles	104	157	1932
Gonorrhea	399	453	453
Lobar pneumonia	542	646	521
Measles	1437	2983	4364
Meningococcus meningitis	7	30	16
Mumps	1107	785	956
Paratyphoid B	6	34	7
Scarlet fever	1640	1172	1212
Syphilis	516	560	460
Tuberculosis pulmonary	447	339	299
Tuberculosis other forms	48	30	33
Typhoid fever	3	4	8
Undulant fever	2	3	3
Whooping cough	421	1421	956

*Based on figures for preceding five years

RARE DISEASES

Diphtheria was reported from Danvers, 1, Fall River, 1, Lexington, 6, Melrose, 1, Salem, 1, Somerville, 1, Westwood, 1, Worcester, 4, total, 16.

Meningococcus meningitis was reported from Beverly, 1, Boston, 3, Franklin, 1, Holyoke, 1, New Bedford, 1, total, 7.

Paratyphoid B was reported from Fall River, 2, Lynn, 3, Reading, 1, total, 6.

Pfeiffer bacillus meningitis was reported from Spencer, 1.

Septic sore throat was reported from Arlington, 1, Boston, 4, Cambridge, 2, Greenfield, 1, Lawrence, 2, Lexington, 1, Lowell, 1, Lynn, 13, Randolph, 1, Salem, 1, Waltham, 1, total, 28.

Trichinosis was reported from Boston, 4.

Typhoid fever was reported from Brookline, 1, Revere, 1, Watertown, 1, total, 3.

Undulant fever was reported from Clarksburg, 1, Sturbridge Center, 1, total, 2.

The incidence of chickenpox dropped from a record high of three months duration to a more normal figure.

Home Indemnity Company, New York, N Y
 Indemnity Insurance Company of North America, Philadelphia, Pa
 London and Lancashire Indemnity Company, Hartford, Conn.
 London Guarantee and Accident Company, Limited, New York, N Y
 Maryland Casualty Company, Baltimore, Md
 Massachusetts Bonding and Insurance Company, Boston, Mass.
 Metropolitan Casualty Insurance Company of New York, Newark, N J
 National Casualty Company, Detroit, Mich
 National Surety Corporation, New York, N Y
 New Amsterdam Casualty Company, Baltimore, Md
 New York Casualty Company, New York, N Y
 Norwich Union Indemnity Company, New York, N Y
 Ocean Accident and Guarantee Corporation, Limited, New York, N Y
 Oregon Automobile Insurance Company of Portland, Portland, Oregon
 Pacific Indemnity Company, Los Angeles, Calif
 Phoenix Indemnity Company, New York, N Y
 Preferred Accident Insurance Company, New York, N Y
 Royal Indemnity Company, New York, N Y
 Seaboard Surety Company, New York, N Y
 Standard Accident Insurance Company, Detroit, Mich
 Standard Surety and Casualty Company of New York, New York, N Y
 Sun Indemnity Company, New York, N Y
 Travelers Insurance Company, Hartford, Conn
 Travelers Indemnity Company, Hartford, Conn.
 United States Casualty Company, New York, N Y
 United States Fidelity and Guaranty Company, Baltimore, Md
 United States Guarantee Company, New York, N Y
 Yorkshire Indemnity Company, New York, N Y
 Zurich General Accident and Liability Insurance Company, Limited, Chicago, Ill.

American Mutual Liability Insurance Company, Boston, Mass.
 Liberty Mutual Insurance Company, Boston, Mass
 Lumbermens Mutual Casualty Company, Boston, Mass
 Merchants Mutual Casualty Company, Boston, Mass

RESTORATION OF LICENSE

To the Editor This is to inform you that at the meeting of the Board of Registration in Medicine held April 28, it was voted to restore the certificate of registration of Dr Russell B. Street, of Conway

STEPHEN RUSHMORE, M.D., *Secretary*

Board of Registration in Medicine,
 State House, Boston.

HEALTH CONSERVATION CONTEST

To the Editor The trophy awarded to the Boston Chamber of Commerce, in recognition of Boston's achievement in winning the 1937 Inter-City Health Conservation Contest for cities of 500,000 or over, now adorns the office of the Boston Health Commissioner

All agencies and individuals who contributed to the winning of the award, as well as all others interested, are cordially invited to come to the office of the Health Commissioner in order to see this trophy, which is a bronze tablet or plaque.

The Boston Health Department takes this occasion again to express its thanks to all who, by their co-opera-

tion and by their contribution of data upon preventive-medicine measures, aided in the winning of this award.

H F R. WATTS, M.D., *Health Commissioner*

City Hall Annex,
 Boston

GOVERNMENTAL CONTROL OF THERAPEUTIC PREPARATIONS

To the Editor The American Society for Pharmacology and Experimental Therapeutics unanimously adopted the following resolution at its twenty-ninth annual meeting held in Baltimore, Maryland, April 2

The American Society for Pharmacology and Experimental Therapeutics, Inc., views with alarm the lack of statutory regulation of the sale or use of dangerous therapeutic preparations, which result in such tragedies as the recent series of deaths from Elixir of Sulphanilamide and from contaminated serum. Furthermore, the present and increasing promiscuous use by the public and especially the youth of this country of drugs having either a pronounced stimulating effect or a profound depressing effect on the nervous system is an alarming situation calling for immediate remedial measures in the interest of public health and safety. Therefore, the American Society for Pharmacology and Experimental Therapeutics, Inc., in annual meeting assembled, respectfully but firmly urges that the governmental authorities, through Congress, be given the necessary power to regulate the sale to or the use by the general public of such preparations as are dangerous or inimical to public health and safety. Be it further resolved that new or untried drugs should not be allowed to come into use by the general public before authoritative sanction has been obtained. Be it further resolved that copies of this resolution be sent to all appropriate governmental and medical organizations

G P GRABFIELD, M.D., *Secretary*

319 Longwood Avenue,
 Boston

REPORT OF MEETING

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

A meeting of the Boston Society of Psychiatry and Neurology was held at the Boston Medical Library on April 21. Dr Tracy J. Putnam presided. Following a brief business meeting, four papers were presented.

The first paper was given by Dr Putnam and dealt with "The Relief of Unilateral Paralysis Agitans by Section of the Pyramidal Tract." Two patients were shown, with moving picture demonstrations of their symptoms prior to operation. The first patient was a fifty-seven-year-old man with incapacitating paralysis agitans affecting the left side. Following section of the left pyramidal tract, his tremor subsided almost completely, and he was able to perform many co-ordinated movements which had previously been impossible. The second patient was a thirty-two-year-old woman, who had been almost totally incapacitated by paralysis agitans on her right side. She showed almost complete relief of tremor following section of the right pyramidal tract. Both these patients showed no impairment of voluntary motor power and co-ordination postoperatively. In the first patient the abnormal reflexes (Hoffmann, Babinski, Gordon, Rossolimo, and so forth) of pyramidal tract damage appeared

the enactment of the legislation, would give to the State of Massachusetts a commissioner of the highest standing.

As soon as the bill was introduced, quiet but vigorous opposition developed, the *Boston Evening Transcript* taking the lead. Although the Governor and many physicians and laymen appeared in its support, when it emerged from the committee, it was hardly a skeleton of the original bill.

Dr Biggs, the New York commissioner, chanced to be in town, read the bill and pronounced it a workable, though not ideal, piece of legislation.

With that endorsement from such an astute politician, the committee was encouraged to continue its efforts to have the bill enacted. But at one of the last hearings before the Senate Ways and Means Committee, the representatives of the doctors were astonished to have an assistant from the Board of Health appear and say that he had been instructed by the author of the original draft of the bill to appear before the committee and state that he considered the bill then before the Senate unworkable and therefore, that he withdrew his approval of the proposed legislation.

In spite of this unexpected blow, Governor Walsh was able to win over the chairman of the Ways and Means Committee to support the bill and it was passed at the final session of the legislature early in July, 1914.

The legislature adjourned, and the bill was a law, a new commissioner was to be appointed, but Dr Heiser could not be found. Even his best friends could not locate him. A commissioner *pro tem* was appointed, and finally the missing Dr Heiser reported to the Governor that, as he had heard nothing from Massachusetts for over six months, he had concluded that the legislation had not been enacted and that he had yielded to the offer of the Rockefeller Foundation to become its health agent—an office which he has so efficiently filled. He suggested to the Governor the names of three men in the United States Public Health Service, who, he was sure, would be able to organize the new department.

Soon after this, the Governor was thrown from his horse and was laid up with a broken arm. Only a few knew of the fact that Dr Heiser was unable to take the post. This knowledge was kept secret, as the Governor was most anxious to redeem his pledge that the new commissioner should be a man of undoubted ability and with public-health training.

Finally, he asked Mr McSweeney and the writer to go to Washington to see President Wilson and ask that Massachusetts should be given, for a term of years, an able man from the United States Public Health Service to assume the duty of organizing the new Department of Public Health. Mr McSweeney was to represent that here was a Democratic governor in a then Republican state who had promised that he would give to the doctors and the people of the State an efficient, well trained health commissioner, and that the loss of their support would be fatal in an uphill fight for re-election.

Although Mr McSweeney did not see the President, he did interview Surgeon General Blue. The three names were given to him, and he was asked for one of them. The Surgeon General threw up his hands in horror and said,

"You gentlemen have named the three best men in the service. I cannot let one of them go." He offered a substitute, who, on investigation, was found to be undesirable for this position.

The following day, Surgeon General Blue finally agreed that Dr Alan J McLaughlin, one of the men asked for, might be released when a piece of work on which he was engaged was finished. Then, for one reason or another,

the negotiations dragged until Governor Walsh, taking an active hand in the matter, communicated directly with Dr McLaughlin, and the appointment was made.

Thus, Governor Walsh redeemed his pledge that he would appoint, as the commissioner of public health, a man highly trained in public health matters.

ARTHUR K. STONE, M.D.

Framingham Center,
Massachusetts

INSURANCE COMPANIES THAT HAVE ACCEPTED THE GENTLEMEN'S AGREEMENT

To the Editor I have been asked a number of times for the names of the insurance companies which have accepted the Gentlemen's Agreement. I am enclosing such a list and believe it would be advisable to have it published in the *Journal* so that each member of the Society could know the companies that are included.

H. M. LANDESMAN, M.D.

366 Commonwealth Avenue,
Boston, Mass

* * *

The list of insurance companies doing business in Massachusetts under the Gentlemen's Agreement is as follows:

Accident and Casualty Insurance Company of Winterthur, Switzerland, of New York, New York, N Y

Aetna Casualty and Surety Company, Hartford, Conn.

Aetna Life Insurance Company, Hartford, Conn.

American Automobile Insurance Company, St. Louis, Mo

American Bonding Company of Baltimore, Baltimore, Md.

American Casualty Company, Reading, Pa.

American Employers' Insurance Company, Boston, Mass.

American Surety Company of New York, New York, N Y

American Re-Insurance Company, New York, N Y

Associated Indemnity Corporation, San Francisco, Calif

Bankers Indemnity Insurance Company, Newark, N J

Car and General Insurance Corporation, Limited, New York, N Y

Central Surety and Insurance Corporation, Kansas City, Mo

Century Indemnity Company, Hartford, Conn.

Columbia Casualty Company, New York, N Y

Commercial Casualty Insurance Company, Newark, N J

Continental Casualty Company, Chicago, Ill.

Eagle Indemnity Company, New York, N Y

Employers' Liability Assurance Corporation, Limited, Boston, Mass

Employers' Reinsurance Corporation, Kansas City, Mo

European General Reinsurance Company, Limited, New York, N Y

Fidelity and Casualty Company of New York, New York, N Y

Fidelity and Deposit Company of Maryland, Baltimore, Md.

Fireman's Fund Indemnity Company, San Francisco, Calif

First Reinsurance Company of Hartford, Hartford, Conn

General Accident, Fire and Life Assurance Corporation, Limited, Philadelphia, Pa.

General Reinsurance Corporation, New York, N Y

Glens Falls Indemnity Company, Glens Falls, N Y

Globe Indemnity Company, New York, N Y

Great American Indemnity Company, New York, N Y

Hartford Accident and Indemnity Company, Hartford, Conn

Hartford Steam Boiler Inspection and Insurance Company, Hartford, Conn

Home Indemnity Company, New York, N Y
 Indemnity Insurance Company of North America, Philadelphia, Pa.
 London and Lancashire Indemnity Company, Hartford, Conn
 London Guarantee and Accident Company, Limited, New York, N Y
 Maryland Casualty Company, Baltimore, Md
 Massachusetts Bonding and Insurance Company, Boston, Mass.
 Metropolitan Casualty Insurance Company of New York, Newark, N J
 National Casualty Company, Detroit, Mich
 National Surety Corporation, New York, N Y
 New Amsterdam Casualty Company, Baltimore, Md
 New York Casualty Company, New York, N Y
 Norwich Union Indemnity Company, New York, N Y
 Ocean Accident and Guarantee Corporation, Limited, New York, N Y
 Oregon Automobile Insurance Company of Portland, Portland, Oregon
 Pacific Indemnity Company, Los Angeles, Calif
 Phoenix Indemnity Company, New York, N Y
 Preferred Accident Insurance Company, New York, N Y
 Royal Indemnity Company, New York, N Y
 Seaboard Surety Company, New York, N Y
 Standard Accident Insurance Company, Detroit, Mich
 Standard Surety and Casualty Company of New York, New York, N Y
 Sun Indemnity Company, New York, N Y
 Travelers Insurance Company, Hartford, Conn
 Travelers Indemnity Company, Hartford, Conn
 United States Casualty Company, New York, N Y
 United States Fidelity and Guaranty Company, Baltimore, Md.
 United States Guarantee Company, New York, N Y
 Yorkshire Indemnity Company, New York, N Y
 Zurich General Accident and Liability Insurance Company, Limited, Chicago, Ill.
 American Mutual Liability Insurance Company, Boston, Mass.
 Liberty Mutual Insurance Company, Boston, Mass
 Lumbermens Mutual Casualty Company, Boston, Mass
 Merchants Mutual Casualty Company, Boston, Mass

RESTORATION OF LICENSE

To the Editor This is to inform you that at the meeting of the Board of Registration in Medicine held April 28, it was voted to restore the certificate of registration of Dr Russell B Street, of Conway

STEPHEN RUSHMORE, M.D., *Secretary*

Board of Registration in Medicine,
 State House, Boston

HEALTH CONSERVATION CONTEST

To the Editor The trophy awarded to the Boston Chamber of Commerce, in recognition of Boston's achievement in winning the 1937 Inter-City Health Conservation Contest for cities of 500,000 or over, now adorns the office of the Boston Health Commissioner

All agencies and individuals who contributed to the winning of the award, as well as all others interested, are cordially invited to come to the office of the Health Commissioner in order to see this trophy, which is a bronze tablet or plaque.

The Boston Health Department takes this occasion again to express its thanks to all who, by their co-opera-

tion and by their contribution of data upon preventive-medicine measures, aided in the winning of this award.

H F R. WATTS, M.D., *Health Commissioner*
 City Hall Annex,
 Boston.

GOVERNMENTAL CONTROL OF THERAPEUTIC PREPARATIONS

To the Editor The American Society for Pharmacology and Experimental Therapeutics unanimously adopted the following resolution at its twenty ninth annual meeting held in Baltimore, Maryland, April 2

The American Society for Pharmacology and Experimental Therapeutics, Inc., views with alarm the lack of statutory regulation of the sale or use of dangerous therapeutic preparations, which result in such tragedies as the recent series of deaths from Elixir of Sulphanilamide and from contaminated serum. Furthermore, the present and increasing promiscuous use by the public and especially the youth of this country of drugs having either a pronounced stimulating effect or a profound depressing effect on the nervous system is an alarming situation calling for immediate remedial measures in the interest of public health and safety. Therefore, the American Society for Pharmacology and Experimental Therapeutics, Inc., in annual meeting assembled, respectfully but firmly urges that the governmental authorities, through Congress, be given the necessary power to regulate the sale to or the use by the general public of such preparations as are dangerous or inimical to public health and safety. Be it further resolved that new or untried drugs should not be allowed to come into use by the general public before authoritative sanction has been obtained. Be it further resolved that copies of this resolution be sent to all appropriate governmental and medical organizations

G P GRABFIELD M.D., *Secretary*

319 Longwood Avenue,
 Boston

REPORT OF MEETING

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

A meeting of the Boston Society of Psychiatry and Neurology was held at the Boston Medical Library on April 21. Dr Tracy J Putnam presided. Following a brief business meeting, four papers were presented.

The first paper was given by Dr Putnam and dealt with 'The Relief of Unilateral Paralysis Agitans by Section of the Pyramidal Tract'. Two patients were shown, with moving-picture demonstrations of their symptoms prior to operation. The first patient was a fifty-seven year-old man with incapacitating paralysis agitans affecting the left side. Following section of the left pyramidal tract, his tremor subsided almost completely, and he was able to perform many co-ordinated movements which had previously been impossible. The second patient was a thirty-two-year-old woman, who had been almost totally incapacitated by paralysis agitans on her right side. She showed almost complete relief of tremor following section of the right pyramidal tract. Both these patients showed no impairment of voluntary motor power and co-ordination postoperatively. In the first patient the abnormal reflexes (Hoffmann, Babinski, Gordon, Rossolimo, and so forth) of pyramidal tract damage appeared

postoperatively. In the second patient there had been some signs of pyramidal-tract disease present before operation, and no increase in these could be determined postoperatively. Other types of operation for paralysis agitans have been reported in the literature as unsuccessful, including anterior-quadrant section of the extrapyramidal fibers and also section of the posterior columns.

The second paper of the evening was presented by Dr. Paul F. A. Hoefler and Dr. Putnam on "Electromyographic Studies in Spastic Conditions and in Paralysis Agitans." Dr. Hoefler demonstrated a series of electromyographic tracings from the muscles of patients. Potentials were determined by superficial leads on the skin and by penetrating muscle electrodes. It was found that the ankle clonus of spastic extremities was composed of rhythmic bursts of action impulses with quiescent intervals. Each burst had a definite pattern of amplitude. Single ankle jerks in normals were found to consist of single diphasic discharges. It was possible to get contralateral reflex discharges in spastics, and also homolateral reflexes from other muscles of the same side. Single ankle jerks in spastics were followed by an afterdischarge.

Electromyographic recordings in paralysis agitans showed a rhythmic, regular series of discharges with quiescent intervals, bearing a close resemblance to the tracings in spastic clonus. In patients with unilateral tremors, it was possible to record faint rhythmic discharges from muscles on the unaffected side. In several cases of generalized tremor, leads were taken from numerous muscle groups including the masseter and calf muscles. In these cases, it was found that the rhythm of discharge was the same in all muscles, with variations only in intensity. This synchronicity of action impulses suggests a central discharging mechanism situated high in the neuraxis, the possibility is also brought up that the fibers carrying impulses to various muscles may have graded variations in their size, degree of myelination and conduction time.

Patients with postencephalitic Parkinsonism without tremor showed irregular rhythmic discharges, suggesting the underlying mechanism of cogwheel rigidity.

The effect of curare on clonic tremors in several patients was studied electromyographically. A great reduction in the amplitude of rhythmic discharges was seen, which corresponded with the clinical improvement seen for twenty-four hours after curare administration.

The similarity between clonus and tremor has been commented on by numerous workers and is further substantiated by the electromyographic records. The central basis for the two mechanisms might be suggested to be the same. Further evidence for this is supplied by the results of pyramidal tract section in paralysis agitans.

The third paper was presented by Dr. Wilfred Bloomberg, whose subject was "The Results in the Treatment of Chronic Alcoholism by Benzadrine." A preliminary report. Dr. Bloomberg discussed 10 cases of chronic alcoholism that have been under benzadrine treatment during the past year. Most of the cases were patients who had tried numerous other forms of therapy without success. The majority appeared to be definitely benefited by benzadrine, with the alcohol intake completely eliminated in some. It was suggested that the drug acted to relieve depression and to supply a "lift," during which alcohol was no longer necessary. It provides a promising means of producing a latent interval of sobriety for several months, during which time psychotherapy may be introduced with better effect.

Dr. Bloomberg also presented several slides showing the studies which have been made on a series of narcolepsy

patients, who have been under intensive benzadrine treatment for the past two years. These included blood counts, metabolic determinations, blood pressure readings, and cardiac, renal and hepatic studies. No abnormalities resulting from the drug could be found in any of the patients, some of whom had been receiving 120 mg. a day for two years. No symptoms of addiction were observed.

The final paper was presented by Dr. Joseph J. Michaels and Miss Sylvia E. Goodman, it was entitled "The Incidence and Age of Cessation of Enuresis in One Thousand and Neuropsychiatric Patients." Dr. Michaels demonstrated a series of statistical studies made on 1000 patients at Ann Arbor, with 1000 representative normals as a control group. The highest incidence of enuresis, together with the longest persistence of enuresis, was found in the group of patients with psychiatric behavior problems and psychopathic personalities. The lowest incidence was encountered in the group of frank psychotics. The percent age of incidence in normals lay between these two groups.

Enuresis is a significant index of disharmony within the personality, indicating a lack of maturation. The frequent history of early enuresis with later delinquency suggests a disturbance in the fundamental psychobiologic mechanism.

NOTICES

CANADIAN MEDICAL ASSOCIATION

The Canadian Medical Association is holding its sixty-ninth annual meeting in Halifax, Nova Scotia, on June 20, 21, 22, 23 and 24. A highly interesting program consisting of approximately one hundred papers, clinics and demonstrations will be presented. To all fellows of the American Medical Association we extend a cordial invitation to attend. Registration as a guest will be effected upon presentation of a card of fellowship in the American Medical Association.

Inasmuch as the American Medical Association is holding its annual session this year in San Francisco, we should particularly like to remind the fellows residing in the New England states and on the Atlantic seaboard, that, if they find it inconvenient to attend their own meeting, a very hearty welcome awaits them in Halifax.

T. C. ROUTLEY, M.D., *General Secretary*,
Canadian Medical Association.

NEW ENGLAND SOCIETY OF PHYSICAL MEDICINE

There will be a special meeting of the New England Society of Physical Medicine in the Men's Lounge, Hotel Bradford, Thursday, June 2, following the program of the Section of Radiology and Physiotherapy of the Massachusetts Medical Society.

Members are urged to attend the excellent program of the section in the Oval Room at 9:30 a. m.

WILLIAM D. McFEE, M.D., *Secretary*

RADIO BROADCASTS

The ninth group of weekly broadcasts sponsored by the American Medical Association and the National Broadcasting Company concern health knowledge. These dramatized health messages are intended to furnish supplementary material for health teaching in junior and senior high schools and are broadcast every Wednesday

from 2 00 to 2 30 p. m. over the Red Network. The dates and subjects are as follows

June 1—Vacation Plays and Mis-plays Making the vacation a real contribution to health and recreation.

June 8—Graduation and Then What? A new phase of life begins at commencement, and health contributes to success

June 15—What Medicine Offers for Health Flashes from the American Medical Association meeting at San Francisco, giving high lights of medical progress

CLINICS FOR CRIPPLED CHILDREN IN MASSACHUSETTS, UNDER THE PROVISIONS OF THE SOCIAL SECURITY ACT

CLINIC	DATE	ORTHOPEDIC CONSULTANT
Haverhill	June 1	Arthur T. Legg
Lowell	June 3	Albert H. Brewster
Salem	June 6	Harold C. Bean
Brockton	June 9	George W. Van Gorder
Gardner	June 14	Mark H. Rogers
Springfield	June 15	Garry deN. Hough, Jr.
Worcester	June 17	John W. O'Meara
Pittsfield	June 20	Francis A. Slowick
Fall River	June 27	Eugene A. McCarthy
Hyannis	June 28	Paul L. Norton

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

The oral, clinical and pathological examinations for Group A and Group B applicants will be held in San Francisco, California, on Monday and Tuesday, June 13 and 14

An informal dinner for the diplomates of the board, their wives and others interested in the work of the board, will be held at the Palace Hotel, San Francisco, on Wednesday evening, June 15, at 7 00. Dr. William D. Cutter, secretary of the Council on Medical Education and Hospitals of the American Medical Association, will address the group

Application blanks and booklets of information may be obtained from Dr. Paul Titus, *Secretary*, 1015 Highland Building, Pittsburgh, Pennsylvania

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MAY 30

TUESDAY MAY 31

- Massachusetts Medical Society annual meeting Hotel Bradford Boston
9:30 a. m. Massachusetts General Hospital Thoracic clinic. Ether Dome.
10 a. m. 12:30 p. m. Tumor clinic Boston Dispensary
12:15 p. m. Tufts Medical Alumni luncheon Hotel Bradford Boston
12:30 p. m. Harvard Medical Alumni luncheon Hotel Bradford Boston.
3:5 p. m. New England Regional Committee on Fractures of the American College of Surgeons. Hotel Bradford Boston

WEDNESDAY JUNE 1

- Massachusetts Medical Society annual meeting Hotel Bradford, Boston
8 a. m. Massachusetts General Hospital. Grand rounds. Orthopedic Department.
12:30 p. m. New England Alumni Luncheon meeting Baltimore Medical College College of Physicians and Surgeons University of Maryland Medical School Hotel Statler Boston
2:30 p. m. Massachusetts Medico-Legal Society Hotel Bradford Boston

THURSDAY JUNE 2

- Massachusetts Medical Society annual meeting Hotel Bradford Boston.
8 a. m. Massachusetts General Hospital Circulatory clinic rounds
11 a. m. Massachusetts General Hospital Medical grand rounds
12 m. Massachusetts General Hospital Clinicopathological conference

FRIDAY JUNE 3

- 10 a. m. Massachusetts General Hospital Fracture rounds
10 a. m. 1:30 p. m. Tumor clinic Boston Dispensary

SATURDAY JUNE 4

- 10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr. Henry A. Christian

Open to the medical profession

- MAY 31—Tufts Medical Alumni Luncheon Page 858 issue of May 19
MAY 31—Harvard Medical Alumni Association Page 858 issue of May 19
MAY 31—The New England Regional Committee on Fractures of the American College of Surgeons Page 858 issue of May 19
MAY 31 JUNE 1 and 2—Annual meeting of the Massachusetts Medical Society Hotel Bradford Boston
JUNE 1—Massachusetts Medico-Legal Society Page 858 issue of May 19
JUNE 1—New England Alumni Baltimore Medical College, College of Physicians and Surgeons University of Maryland Medical School Page 858 issue of May 19
JUNE 1 and 2—National Society for the Advancement of Gastroenterology Page 746 issue of April 28
JUNE 2—New England Society of Physical Medicine. Page 902
JUNE 6 7 8 and 9—American Association of Industrial Physicians Page 499 issue of March 17
JUNE 10 and 11—American Heart Association Page 707 issue of April 21
JUNE 13 14 and 15—American Board of Obstetrics and Gynecology Notice above.
JUNE 13-17—American Medical Association San Francisco
JUNE 13 OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 282 issue of February 10
JUNE 20-24—Canadian Medical Association Page 902.
JUNE 23—Pentucket Association of Physicians Hotel Bartlett, 95 Main Street Haverhill 8:30 p. m.
SEPTEMBER 12-14—American Association for the Study of Gout Page 545 issue of March 24
OCTOBER 17-21—Clinical Congress of the American College of Surgeons New York City
OCTOBER 24-26—Academy of Physical Medicine Scientific Session. Washington D. C.

DISTRICT MEDICAL SOCIETIES

HAMPDEN

Meeting will be held on the fourth Tuesday in July

PLYMOUTH

Meeting will be held at 11 a. m. on July 21

BOOKS RECEIVED FOR REVIEW

- Histological Technique For normal tissues morbid changes and the identification of parasites* H. M. Carleton and E. H. Leach. Second edition. 383 pp. London, New York and Toronto Oxford University Press, 1938 \$7.25
Thoracic Surgery A revised and abridged edition of Sauerbruch's Die Chirurgie der Brustorgane Ferdinand Sauerbruch and Laurence O. Shaughnessy 394 pp. Baltimore William Wood & Company, 1937 \$13.50
Sex Satisfaction and Happy Marriage Alfred Henry Tyrer 160 pp. New York Emerson Books, Incorporated, 1938 \$2.00
Play and Mental Health Principles and practice for teachers John Eisele Davis. 202 pp. New York A. S. Barnes & Company, 1938 \$2.50
A Manual of Operating Room Procedures Almira W. Hoppe and Lucile M. Halverson. 239 pp. Minneapolis The University of Minnesota Press, 1938 \$2.00
A Practical Guide to Massage C. Irene Carpenter 127 pp. Baltimore William Wood & Company, 1937 \$2.00
A Text-Book of Pharmaceutics Arthur Owen Bentley Fourth edition 1001 pp. Baltimore William Wood & Company, 1937 \$5.00

Massage and Remedial Exercises in Medical and Surgical Conditions Noël M Tidy Third edition 456 pp Baltimore William Wood & Company, 1937 \$5 25

A Manual of Tuberculosis For nurses and public health workers E Ashworth Underwood Second edition 404 pp Baltimore William Wood & Company, 1938 \$3 25

Clinical Chemistry in Practical Medicine C P Stewart and D M Dunlop Second edition 372 pp Baltimore William Wood & Company, 1937 \$4 00

Athletic Injuries Prevention, diagnosis and treatment Augustus Thorndike, Jr 208 pp Philadelphia Lea & Febiger, 1938 \$3 00

The Hospital Head Nurse Her functions and her preparation Mary Marvin Wayland. Edited by Isabel M Stewart. 388 pp New York The Macmillan Company, 1938 \$3 50

Leukemia and Allied Disorders Claude E Forkner 333 pp New York The Macmillan Company, 1938 \$5 00

Studies from the Rockefeller Institute for Medical Research Reprints Volume 106 634 pp New York The Rockefeller Institute for Medical Research, 1938 \$2 00

A Text-Book of Pathology An introduction to medicine William Boyd 1064 pp Philadelphia Lea & Febiger, 1938 \$10 00

Civilization and Disease C P Donnison 222 pp Baltimore William Wood & Company, 1938 \$3 00

Essentials of Psychiatry George W Henry Third edition 465 pp Baltimore The Williams & Wilkins Company, 1938 \$5 00

The Practice of Urology Leon Herman. 923 pp Philadelphia and London W B Saunders Company, 1938 \$10 00

A Textbook of Clinical Pathology Edited by Roy R. Kracke. 567 pp Baltimore William Wood & Company, 1938 \$6 00

BOOK REVIEWS

The Patient and the Weather William F Petersen, with the assistance of Margaret E. Milliken Volume 4, Part 3 651 pp Ann Arbor Edwards Brothers, Inc., 1938 \$10 00

This third part of Volume 4 of the monographs on *The Patient and the Weather* deals with surgical problems of organic disease Petersen in the preface states 'Superficially it links the patient who may be suffering from an acute abdominal condition to meteorological environment.

But the mere precipitation of the acute clinical event by meteorological change is not of ultimate significance for the broader problem If the acute episode is so conditioned, the pathogenesis may in some fashion be associated with the meteorological environment as one of a series of factors in the constellation Many modern surgeons may be chagrined to learn that this is no new approach to their field of work but dates back to a dictum of Hippocrates One should be especially on one's guard against the most violent changes of the seasons, and unless compelled, one should neither purge nor apply cautery or knife to the bowels, until at least ten days have passed'

In the previous monographs in this series the scientific explanation of the effect of meteorologic change has been discussed In part this effect is one of vasomotor and neuromuscular dysfunction For the tissue phase of increasing blood pressure, that is, the relative closure of portions of the vascular bed, Petersen uses the designation ARS, for during this status there is a relative anoxemia, anabolism, reduction and spasm, with higher pH and enhanced adrenal effectiveness His COD phase is one of decreasing blood pressure—a period of catabolism, oxidation and dilatation of vessels, with 'thyroid'

preponderance. A pressor increase (ARS) may be due to a meteorologic alteration (polar infall, unusual heat or humidity), emotional or physical trauma, exertion or infection, therefore ARS is a sympathicotonic phase.

The author suggests several observations which have a bearing on general surgical problems the role of smooth muscle spasm (vascular as well as visceral), and its associated anoxia of related mucous membranes, for necrosis and bacterial penetration, the rhythm of organic stimulation and of overstimulation and fatigue as it concerns resistance, and the relation of this to season, to the individual meteorologic episode, to the menstrual cycle, and so forth

This large quarto book contains 482 graphs and tables and numerous case histories In the introductory chapter Petersen discusses the effect of environment on the 'humors,' infection and inflammation. The major themes of the succeeding thirteen chapters are ulcer of the stomach and duodenum, Meckel's diverticulum, the gall bladder, acute pancreatitis, appendicitis, disturbances of the bowels, ectopic pregnancy, postoperative complications, vascular accidents, brain abscess, meningitis, orthopedic cases, ophthalmological episodes, and the endemology of surgical diseases References to the literature are given in copious footnotes

Before specifically presenting, by case histories and charts, the coincidence of clinical episodes and weather changes in the several diseases under consideration, the author discusses the recent concepts of their pathogenesis. These discussions should be of great interest to surgeons, particularly those concerning peptic ulcer and appendicitis The larger charts, which combine meteorologic and clinical data, are soon comprehended. Unusual episodes in the course of cases are designated by numerals in circles These episodes are similarly marked in the case histories The effect of seasonal and sun spot cycles is discussed Every surgeon need not be a meteorologist or astronomer, but every thoughtful surgeon will profit by examining this work by Petersen.

In an effort to make the publication of scholarly and technical books in small editions pay for themselves, publishers are making use of the photolithograph process from perfect type script, the pages are large, but the type clear and easily readable.

Man Against Himself Karl A. Menninger 485 pp New York Harcourt, Brace and Company, 1938 \$3 75

This book unfortunately is not scientific. It seemingly is written for lay readers, but even lay readers will hesitate to accept such a statement as, 'In the unconscious we are still animals and there is no reason to believe that any animal fears death'

The book is interesting for what the writer discloses rather than what he headlines. The statement, 'The fourth section deals with an extension of the theory of self destruction to the problem of physical disease, an extension which must be considered, as yet, largely hypothetical,' discloses an unexpected hesitance on the part of the author—a Freudian disciple—to maintain the undisputable authenticity of his theories Also, the remark of the author, 'I have a large file full of such clippings, when referring to the suicides of former patients, discloses what many have feared that as a type of therapy the Freudian, or perhaps better the pseudo-Freudian, doctrines may often upset unbalanced minds and result in suicide.

So far as assistance in handling the suicide problem is concerned this book adds little—in fact the author's suggestions seem far from novel, original or well expressed to anyone familiar with Christ's teachings.

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VOLUME 218

JUNE 2, 1938

NUMBER 22

THE PASSING OF SURGICAL YEOMEN

ALLEN G. RICE, M.D.*

SPRINGFIELD MASSACHUSETTS

AN ORATION postulates an orator. When therefore, an oration is ventured by one neither oratorically endowed nor trained, only natural is query as to the propriety of the caption. Custom, however, oftentimes violates the true meaning of words until their new connotations come to be tolerated without undue qualms. That this society is by no means innocent of abetting such neologic misdemeanor is apparent on scanning the list of past occupants of this rostrum. There seem to have been very few orators. Be that as it may, they triumphed, one and all, with the brilliance and worth of their offerings. The honor of being chosen to this company of the specially ordained is signal. The task of nearing the standard they set is awesome. Yet earnestly withal has this year's conscript striven to be worthy of his hire. He stands here in all humbleness as his becomes the latest name added to that famed roster whose luster he can only hope will not thereby be unduly dimmed.

Yeomen are gallant men who render great and loyal service. The title was first bestowed on those chosen for their valor and lealty to be trusted bodyguards for kings and nobles. Somewhat later whole companies of tried loyalty were so dubbed, and later still regiments that to this day are proud of their traditional crest. In all the world's wars yeomen were the backbone of armies and the mainstay of navies. As conflicts waned and peacetimes came oftener and lasted longer, and as unwarlike pursuits were more generally followed, the honored title of yeoman was given men who otherwise than as soldiers rendered equally great and loyal service. So through the years the order of yeomanry gained in stature, luster and good repute. In husbandry and trade, in the crafts and arts, in the missions of priesthood and teaching, in all lines of human endeavor, the staid and sturdy men were the yeomen. Lords over none, under human bondage to no man, they were freeborn

commoners. Without any ado they went earnestly and noiselessly about their business. Never did they vision quick reward, but rather the lasting joy and contentment from good works well done. For them sufficient unto the day was the labor thereof. Their virtues were their reward. For their reserve and unobtrusiveness they went unnoted and unsung the while they did the bulk of the world's work. They were the builders of wealth, the winners of knowledge, the guardians of morality. As once they were the might and power of wartime forces, so later in peace were they the strength and the weal of social, economic and civic orders, the bulwark of the state, the leaven of civilization, the wellspring of culture.

Hence were they resolute,
Leading the van on every day of battle,
As men who knew the blessings they defended.
They were worth their breeding, which doubt not,
For there was none of them so mean and base
That had not noble luster in his eyes.

Such were yeomen. Their order still lives with all its noble traditions, but its solid ranks of old are thinned. Sturdiest of the league, truest to its unwritten precepts, surest hope for its salvation, are surgical yeomen. They are the grandsons of stanch and peerless forebears, the rank-and-file physicians of yesteryear. These grandsires were the common doctors, they of the commonalty, but of the first and most respected class. For the most part they were countrymen or everyday citizens, physicians of the district. Impelled not by force from without, but from within by the drive of their own strong natures, they were masters of their own destinies, and in all times the strength, the spirit and the glory of the profession. Workers, not idlers, followers but not stragglers, thinkers, not dreamers, servants but not slaves, they bred in themselves the self-respect, the self-reliance, the self-discipline and the self-culture that were priceless gifts to the commonweal of medicine. Neither great renown nor great riches was often

*The Annual Discourse delivered at the annual meeting of the Massachusetts Medical Society, Boston, June 2, 1938.
Visiting surgeon, Springfield Hospital, Springfield, Massachusetts.

theirs True to their self-chosen order of yeomanry, they were the hewers of wood and the carriers of water Through the years their good works went unsung until in the fullness of his heart Robert Louis Stevenson wrote

There are men and classes of men that stand above the common herd, the soldier, the sailor, and the shepherd not infrequently, the artist rarely, rarer still the clergyman, the physician almost as a rule. He is the flower (such as it is) of our civilization, and when that stage of man is done with, and only remembered to be marveled at in the defects of the period, and most notably exhibited in the virtues of the race. Generosity he has, such as is possible to those who practice an art, never to those who drive a trade, discretion, tested by a hundred secrets, tact, tried in a thousand embarrassments, and what are more important, Heracleian cheerfulness and courage. So it is that he brings air and cheer into the sickroom, and often enough, thought not so often as he wishes, brings healing

About the time this tribute to the family doctor was penned, a new order was forming within the ranks of medical men It was joined by those general practitioners with leanings and flairs for surgery Into the new fields opened up by Lister's gift they drove They were the pioneers of modern surgery With boundless faith in their art and with courage undaunted by difficulties and early failures, they pressed on with a daring that bespoke their skill and a caution that vouched their wisdom They need this late day no inspired bard or rare scribe to do them homage Theirs are names that live

It was from these pioneers that sprang a race of surgeons Some of this second generation, those richest endowed with quick heads, daring hearts and deft hands, have become renowned masters of their art They, like their fathers before them, need this day no recalling Rather is it their lowly brethren, that host of general surgeons, long lost from mind and eye in the far-flung surgical world, who, overlooked and unrated, merit, nonetheless, appraisal which has never been vouchsafed They are the surgical yeomen

In this day and hour they are the old guard, in large measure self-made surgeons Their medical-school course and their training as surgical interns were, judged by present lights, meager indeed and of little worth Surgical teaching was encumbered with tradition Operative fields were not many Years of trial and error had not yielded refined and standardized technic The tools of the craft were far from perfected Care before as well as after operation was little understood, therefore crude and sometimes harsh But the old guard never faltered Their own guides on often strange and sometimes uncharted ground, they found their own way Despite their stunted schooling

and training, steadied by common sense, backed by resourcefulness, impelled by need, they overcame their handicaps, and day in and day out have given earnest of the sterling worth of head and hand

These surgical yeomen did, however, have a priceless course of training, nowadays rather disdained Most of them, for one reason and another, began as general practitioners of medicine, and followed that calling for several years As family doctors they took on stature and grew wise in the art of practice, which is the same, be it medical or surgical,—an art, too, which is better mastered at the family bedside than in the hospital ward Not that they neglected surgery Quite the contrary they saw to it that they were known as physicians who did surgery When the time came for them to break away from general practice, enough surgery was forthcoming from their lay followings to tide them over the transitional years before medical brethren entrusted to them patients for operation Whatever sins of omission this apprenticeship of yesteryear may have had, it had few, if any, of commission, and it did have virtues which, if they awarded little of scientific merit, did have something to do, indirectly at least, with the making of dependable and beloved surgeons

Started on their careers with handicaps of under-schooling and inexperience, they found their chosen course roughened by hazards that only their fortitude and resourcefulness overcame They had neither drilled assistants nor skilled anesthetists For many reasons, most of them needful, some becoming, but a few, alas, sordid, all too often they had to tolerate across the table a doctor unused to surgical technic, and at the head another untutored in giving ether Of the two the former was more easily borne His clumsy and risky doings could be watched and guarded against while the operator did all the work himself The anesthetist, however, was a tougher problem Etherizing quite commonly looked down upon as a drab and menial chore with none of the glamorous appeal of the operating room, was usually a leftover job for whosoever at the moment was not otherwise busy It was, then, not at all strange that these casual anesthetists, unfitted for the task and with untoward interest in the open abdomen, too many times harried overburdened surgeons with blue-lipped, wet-throated, rigid, straining patients, or not rarely with pallid, faintly sighing forms whose toneless muscles heralded oncoming shock Furthermore, the tools of these surgical craftsmen were not always of the latest pattern, the fittings and structure of their workshops were like as not

outdated, but from long and close companionship they were endeared to their owners who learned well to use them handily. Indeed, it was no rare feat for them to operate in the home, on the kitchen table, with dry goods from their own Arnold sterilizers, and with instruments boiled on the family cookstove. These and other hardships, endured and transcended, have richly endowed this race of surgical yeomen with the unconquerable spirit, the unshakable poise and the steadiness of mind and hand that only trials unflinchingly faced and resolutely overcome can bequeath.

The first aim of the old guard has ever been to get sick people well. Eager for the learning and skill that would grant them that power, they left no stone unturned to acquire them. They had no urge to be scholars and laid no claim to that high estate, they were just diligent, lifelong students. They read chiefly the pick of weekly and monthly journals, for they knew that most new books were already outdated when published. To quicken their minds they went often to meetings of their peers, there to listen closely, to speak seldom, and better to guide their eager hands, oft as might be though rarelier than they wished, they stole away to surgical meccas where, watching masters, they picked up new leads to diagnosis, new tricks of technic, new wards against disaster and new handling of mishaps.

Of such sterling stock and self-willed discipline are surgical yeomen. There are still a goodly number of them in the land, how many, there is no telling. True to the order of yeomanry, they are the forgotten ones who staff the many hospitals in byways of cities and at rural crossroads. Day in and day out these willing craftsmen go quietly about their business here, there and everywhere, never exploited by the press. And so it is that, notwithstanding master surgeons and their hand-picked helpers in famed clinics, the bulk of the country's surgery is really done by a company of forgotten men.

Mere quantity, however, is no token of the scope and kind of surgery they do. While the former is perhaps not of the widest, its range is by no means narrow. Annual reports from thirty small-town hospitals east of the Mississippi list about the same run of operations as do large clinics, for appendicitis, rupture, gall-bladder disease, cancer of the breast, empyema, pelvic tumors, childbirth repairs and a multitude of traumatic ills. In many there is a quite sizable ratio of thyroidectomies, stomach and bowel resections, splenectomies and rectal excisions, to say naught of orthopedic, urological and some thoracic operating where, be it noted, no specialists are registered. This is no narrow reach of surgical endeavor. More's the wonder, it is

spanned not in part by one man here and another there, but in its entirety by most veoman surgeons. Each and every one of them stands in readiness to take out a gallbladder today, a thyroid tomorrow and a prostate the day after. Spontaneous and natural it is to marvel at the deftness and skill of a master who numbers his thyroidectomies in the thousands, but could he be otherwise with such vast experience? The real wonder is that yeomen who do perhaps one or two, or even less a week, can remove goiters with the dexterity they do.

In order to rate the quality of surgery done anywhere, resort must be had to figures. That is always a risky venture, for statistics can be made to prove almost anything. There are two yardsticks for measuring the worth and benefits of surgery: mortality and morbidity. Now, well-being after operation is not at all easy to record. Percentages of results good and results bad are apt to be gay deceivers, playing as they unwittingly do, patients' emotional self-appraisals against surgeons' optimistic desires. Happy outcomes can be stressed, feigned or hidden by human frailty on the one hand, and on the other, setbacks can be as easily sidetracked, pardoned or shaded by equally human professional zeal. From their very nature, then, morbidity statistics are too sensitive to warping to be nice measuring rods. The death rate, on the contrary, is, save for the chance upset of wrong diagnosis, quite positive and accurate, whatever else betides, patients either live or die. Whether or not low mortality is the chief aim of surgery, it is still on the whole the truest token of its worth, the surest common yardstick for all surgeons.

Averaged from hospital reports, the general surgical death rate at the hands of six master surgeons is 4.6 per cent, of thirty scattered yeomen 4.8 per cent, a creditable showing indeed for the lowly ones. This near parity of outcome is of course wide open to attack. That surgical lords who handle the more hazardous jobs do not have a worse mortality is for them a credit just and merited, but, alas, so intangible it cannot be figured. In all fairness, too, must it be admitted that yeomen, by shunting their more perilous work onto their betters, thereby escape a debit equally merited, but likewise too fitful for computation. Righteous as they seem, however, these entries do not tip the scale but are balanced by factual items. Chieftains, too, have their quota of easy jobs, and as for hard, dangerous and unusual operating, not only are they outfitted and skilled therefor, but they yearn for it. Inasmuch, then, as they bid for it, they should willingly pay the toll. On the

other side of the sheet yeomen not at all rarely find themselves of a sudden faced with most difficult operations. There is no forecasting of surgical hazards. What gives every promise of simplicity may easily prove to be otherwise. And there is no turning back, yeomen have to meet the problem, solve it as best they can and let the chips of mortality fall unbegrudged wheresoever they may. If, forewarned, they choose to dump their desperate jobs onto others, they do but show a wisdom that acknowledges their shortcomings, and a stand by their own conviction that needless mortality has no justification.

When the death rates for specific surgical ills are likewise compared, the scales are still pretty level. Mortalities after herniorrhaphies, cholecystectomies and other common as well as rarer ordeals show but a few decimal points in favor of the lords and masters. With the balance sheet running steadily though slightly in the same direction, it was most enlightening to have figures come forth which seem to prove that in one of the commonest abdominal ailments yeomen have the edge. The finding was most pleasing, too, for surgery today suffers no more stinging rebuke than its showing in appendicitis. All vital statistics vouch beyond peradventure that more people are now dying of appendicitis than ever before. Lay scribes are featuring the ill turn of appendiceal mischief with now and then an air of grim and only half-hidden content. In sober vein, current medical writers bewail the blemish on surgery's escutcheon, but are seemingly at odds with one another over what to do about it. It should be noted, however, that the authors of the surgical lamentations are the leaders in big metropolitan hospitals, the heads of large clinics or their hand-picked lieutenants. The experience of chieftains is so vast it is sort of taken for granted that the results of all others are the same. Of late, however, several surgical yeomen have challenged this inference, and as yet it is not recorded that the gauntlet they threw down has been taken up. Their case rests on figures from three sources: federal records of vital statistics, reports from twelve large clinics and accounts from twenty small hospitals. For the whole country the general death rate of appendicitis hovers from year to year around 3 per cent, for appendectomy in acute and non-perforated cases it is 4.8 per cent, but when complicated by peritonitis the rate jumps to 30 per cent. Taking these national figures as mean levels, the challenging yeomen plot some rather upsetting extremes. Whereas the head surgeons list a general mortality for appendicitis of 4.5 per cent, they achieve one of 2.1 per cent. For all acute cases the former con-

less a death rate of 6.8 per cent, the latter of only 3.1 per cent. And when peritonitis adds its horror, the figures are widest apart: 38.5 per cent against 17.7 per cent. Not content with this pleasing triumph, the challengers go on to show that all records award them in the last decade a yearly drop in death rate, a fall which seems to have eluded their big brethren. There they rest their case. With their usual becoming modesty they vaunt no reasons for their better showing, and with forbearance and kindness learned through many mishaps of their own, they hint no causes for the less happy outcomes of others. In a spirit of fair play, and with an equanimity born of facts, they choose to await in calm contentment the issue of rebuttal.

For the hiding of their good works the old guard themselves are most to blame. They have been too busy to write of their doings, too reticent to speak of them. Their lives have been spent in the rough and tumble of the surgical game, which for long they had to play with the odds against them. Year by year through their own pleadings they have awakened their people to the need for better hospitals, and through their own drive they have brought their workshops up to date. More and more have they picked and trained loyal teams of helpers, and by friendly pleas here and not altogether unkindly insistence there, have won over the layman and his doctor to the gospel that patients fare better with teamworkers than at the hands of casual helpers and etherizers. As they have gained these welcomed changes they have rid themselves of many a hindrance, of many a stress, and have come to the height of their skill and wisdom with the right and the freedom at last to use them to the full.

But these thoroughbreds of the family are more than surgeons, they are gentlemen of the first order, kindly and courteous to all, honoring their leaders, gracious toward their fellows, helpful to younger brethren. In them power and modesty walk together, rare companions these days of might and vainglory. Each in himself is the champion American individualist. He is wedded to the old ways of the surgical art, swayed not by oncoming, thinly disguised mass practice. He was reared in the days when sick people were persons, not records, and he never forgets his bringing up. He knows naught, for example, of a pelvic case in Room 26, but in that bed he has his patient, mother of three children aged two, seven and nine, overworked housewife worrying about her home, Mrs. Mary Jones, whose bleeding fibroid uterus he took out four days ago. The kindly,

personal touch is always with him. When his patients go home from the hospital, he does not hand them wholly over to other doctors, but himself in friendly part watches them through the aftermaths of their ordeals and himself handles the petty discomforts prone later to arise. By so doing he has learned little ways to forestall no few of the untowardnesses that operative haste and post-operative inattentiveness inflict. His reward is an easier, shorter recovery for patients than is sometimes won by others who, interested in records more than in persons, hand over their cases at an early date to the mercies of this or that kindly but less adept family doctor.

Gentleman by habit, surgeon by training, by his faith he is sworn guardian of his calling. Fiercely and ready to turn to good account the stupendous gains in surgical knowledge, he stands abashed at the strange ways some people would have that knowledge used for suffering mankind. He wonders at the suave effrontery of outsiders who, with insight dim, would nonetheless tell him how best to handle the ills of the people. With the wealth of understanding that is his from a life soent on the firing line, he knows that, despite the social angles the meddlers stress, the true practice of medicine and surgery is personal and individual. For him that is the solid rock on which his calling was built, and on that firm base it has through the ages grown to stature that commands respect for the doctor, though oft, alas denied the profession at large.

There is good reason to fear that the fate of this race is to be forgotten while here, remembered only when gone. Already there are signs and omens round and about that the order of surgical yeomen and what it stands for are passing. Many a town and urban district are seeing the last of them. Their times and ideals are seemingly outlived, the new day and its values are different.

The old order changeth, yielding place to new,
And God fulfills Himself in many ways,
Lest one good custom should corrupt the world

Without going into the causes thereof, the surgical craft is being more and more split into specialties. The division of labor without any doubt makes for better surgery, but whether it also makes better surgeons may be questioned. More soundly taught and more sharply trained, the new order has greater learning. Whereof the old-timers, with only long-tried empirical lore, had to guess shrewdly, — though usually right, — the newcomers speak with scientific certainty. Yet somehow the cold, sober logic lacks the warm personal touch of the yeomen. Mayhap the latter did now and then

with their manner and speech cloak their ignorance, but they did therewith spread "air and cheer" in the sickroom. Worried parents and relatives do after all like their draughts of science sweetened with human kindness.

Though surgeons of the hour are more deft of hand than their yeoman sires, each is apt to be so only in his chosen and narrow field. And he sticks pretty close to his own bailiwick, whose no-trespass signs he would have heeded as he himself heeds others all about him. On grounds other than his own he does not feel at home, and therein is his weakness. Specialties overlap, and many a borderline illness straddles a surgical line fence. Does a man with a broken back and some signs of cord mischief belong to the orthopedist or the neurological surgeon? If given into the hands of one, the patient may later develop symptoms that call for the skill of the other, whereupon the first expert has either to call upon the second for aid, which sometimes, alas, is honest clash of opinion, or himself muddle along as best he may. The victim must then either swap horses in the middle of the stream, risk his welfare to a balky team or chance a floundering. It can scarce be maintained that any of these choices grants the sufferer the faith in his surgeon and the peace of mind for himself that lessen worry and make for kindly outcomes.

Every year brings forth new measures of organic function, new tests for disease, new mechanical aids to sight, hearing and touch. Scientific beyond all peradventure each and every one of them adds to better understanding of disease, but for a single patient any one of them may easily be misleading. Each is focused not on the whole of any one disease, but on just one, perhaps small, aspect which it may overilluminate. Despite this and other forewarnings, however, newly trained surgeons show a tendency to overrate now one and now another promising but unseasoned helpmeet. Seemingly too they oftentimes lack the faith of their fathers in the findings of their own eyes, ears and fingers, and put their trust rather in new-found guides who, though meaning well, sometimes lead them into grievous error. And scientific though the guidance be, it is not firsthand. For the most part the handling of such measures, tests and aids is beyond the ken and scope of clinical surgeons and is left perforce to biological chemists, roentgenologists, pathologists and the like. The surgeon thus has to accept not only the findings of these cloistered though earnest workers, but also their reasonings. Instead, then, of a firsthand, clear-cut picture of the patient and his disease, he sometimes finds he has a puzzling clutter of ill-matched,

narrow-field negatives which he must shuffle and strive to fit together

Not so has the surgical yeoman been troubled or led astray. As science came into his life, rarely did it upset his long-trying empirical knowledge. At times it shifted his beliefs a mite, but more often it confirmed them. Long forced to do without scientific helpmates, he had trained his own senses to catch the faintest of untoward signs, had schooled his brain to sift and value all his findings. When a perfected measure, test or aid came forth, his common sense quickly rated it, his well-ordered mind neatly stowed it away, and his wisdom made of it a means and not an end. If his touch told him the broken leg was about the length of the other, the weight-bearing line true and the ends of the bone in good contact, he was not to be rushed into resetting because x-ray showed that the fragments were not meeting wholly end to end. Nor did he dally with acute appendicitis because the white-cell count was not high. The way a man lay in bed, the look on his face, the strength of his voice and handclasp, the cry and grunt of a sick child, the stare of a tearless woman, these and countless other like signals of distress told him at a glance things about his patient no test tube or microscope can ever reveal. It was not playing hunches, it was not just intuition, and it was not snap guesswork, it was free play of his wisdom. Often hard put to rationalize his opinions, he was sometimes wholly stumped for explanations. He had seen these things many times and had come to know what they meant. He knew human bodies, their modes of expression, their moods of behavior, and what they signified, and above all he knew human nature and was seldom to be fooled by its vagaries. Not that he frowned on laboratories, quite the contrary, he was deeply grateful for all they taught him about disease. He turned to them often and gladly for needed help, valued their judgments but did not let them confuse him. When their reports confirmed his opinion, he was heartened for his patient's sake, but when they ran counter to his clinical reasoning, again and again reviewed, he put his trust in his own long-trying senses, which had rarely led him far astray.

They have had full lives, these surgical yeomen. For some, toil is over. For many more, years of labor are numbered. Plenty are the omens that this old guard is passing, that many a town and urban district are having their last good general surgeons. Gloomy forebodings notwithstanding, faith in surgical yeomanry's ideals still lives. Remnants of the order, scattered and unorganized,

tend the hallowed light and keep it burning. Here and there bands of the faithful are heartened by tokens of an awakening that holds forth promise for their order. Far in the offing are faint rumblings of discontent with some of the surgical fashions of the day, rumbles that seem to be growing in volume. Grumblings against overspecialization are making themselves heard in high places where heed is being given to thoughtful critics. Only partly muffled are plaints that chairs of clinical surgery might best be held by teachers who, well bred in family bedside manners, would drill their pupils in the art as well as in the theory of practice, and would show them how to treat not just sickness but sick people too. Less and less withheld are discreet whisperings of family doctors that when in need of counsel they are finding in one good surgical yeoman the common sense, the help and the cheer for themselves and their patients that surgical specialists with all their scientific learning so often fail to bring. It is unlikely, however, that these and other voices from within the realms of medicine will do for the cause as much as will future uprisings of laymen. Hushed for now, but some day to be loud indeed, will be the cries of disillusioned men and women against the regimentation and mass practice which social and political meddlers seem about ready to impose. Until that public awakening dawns, the old guard can with patience and kindly forbearance await its coming. Then perchance will yeomen come into their own again. Then will their thinned ranks be recruited, and the blessings, the honored ways and the sterling ideals of surgical yeomanry be saved.

Meanwhile a new order holds sway. It is quite different from the old and has a different touch. It seems destined to do better surgery, but whether its workers will be better surgeons only the years can tell. To those who know the old order best, its passing, together with its standards of service, brings a tinge of sadness and misgiving. Mayhap yesteryear, when their fathers were dying, like doubts were held about this old guard then untried, and by the same token the new order may tomorrow prove today's fears ungrounded too. Just as a heedless world has only of late paid tardy acclaim to its pioneer surgeons, so will it likely be years hence before it bestows equally merited praise on its yeomen. In some future age, when the idea of ruling the world according to the whims of a fanciful social conscience has run its bewildering course, and when individual consciences have come again to the fore, then will there be wishful return to some of the good old

ways of yore. And in that new age may another Stevenson be inspired to extol at long last the passing old guard of today. Until that time comes, this heartfelt tribute is paid them by one whose

lasting joy and satisfaction will ever be that the rich and happy years of his professional life were spent at the side of a surgical yeoman
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THE RELATION OF NEWER DRUGS TO PUBLIC HEALTH

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THE topic assigned to me presents an unusual aspect of pharmacology, though this science, like public health, maintains contact with all other fields of medicine. The recent tragic deaths from the use of diethylene glycol as a solvent for sulfanilamide have emphasized the relation between medicaments and the public health. Indeed the sciences of pharmacology and of public health are allied in type. Both, by their nature, have not developed technics *sui generis*, but use the methods of all the medical sciences directed toward certain goals, defined by the point of view from which each approaches its problems. Pharmacology focuses the separate technics which it uses on the elucidation of the qualitative and quantitative effects of drugs on the animal and plant body and the mechanism of such action as may be produced, similarly public health directs its efforts toward anything that concerns the welfare of our citizenry.

A discussion of the relation of public health to newer drugs necessarily concerns itself with methods of treatment and is a part of the more general topic of the relation of the public-health authorities to the practice of medicine and to the manufacture and dispensing of drugs. Pharmacology in the medical school concerns itself or should concern itself with preparation of the medical student for the use of drugs as tools in his hands for the cure or comfort of the patient. At this period of the student's career the discussion of proprietary remedies, patent medicines and over-the-counter self-medication should be emphasized. Expansion and reiteration of this teaching in the clinical years of the medical school and in the field of preventive medicine is necessary, but is deficient in most schools. After graduation it should become the concern of the legally constituted health authorities to keep the physicians under their jurisdiction continually conscious of these pitfalls of therapeutics. In this the help of graduate schools of medicine should be enlisted. Lack of such teaching increases the burden of the health authorities in their efforts to safeguard the public health. Education, continuous and unremitting is the only

practicable method of breaking down the hold that proprietary medicine has upon the medical and lay public.

With all the efforts that have been made to prevent fraud upon the public, such as the activities of the Food and Drug Administration of the United States Department of Agriculture and of the Council on Pharmacy and Chemistry of the American Medical Association, it has been impossible to provide really adequate legislation. The reason for this is that the problem resolves itself into the simple but thorny one of "truth in advertising," together with a revision of our copyright and patent laws. But a start in this direction has certainly been made. If local health officials can be made acutely conscious of the dangers of the use of proprietary names for common substances, and of secret or semi-secret mixtures, they can do much, even under existing legislation, to diminish these evils by appropriate health education among citizens and physicians.

Six points of contact occur to me at which pharmacological advice becomes essential for adequate formulation of recognized public-health activities. These are as follows:

The supervision and adequate testing of new antiseptics and germicides

An evaluation of the drugs introduced for the treatment or cure of contagious diseases

The maintenance of high standards, both in manufacture and in dispensing of drugs

The investigation of the toxic manifestations of drugs, whether exhibited in suicide, homicide or accidental death

The determination of industrial hazards from chemicals, and investigation of the use of various toxic substances in the treatment of foods

The control of the use of new drugs or new mixtures which may appear on the market without adequate clinical trial

It is evident that these six items involve the whole question of the relation of public health to the practice of medicine. The problem reduces itself to the question of how far the governmental health authorities should intrude into the field of practice. In the evolution of our present state departments of public health it is undeniable that the state has invaded the domain of medical practice to

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a surprising degree. Mental diseases, tuberculosis and cancer are essentially part of our public-health set-up. Serums and vaccines are made in state laboratories, and their distribution and administration are controlled by state health departments. In Massachusetts one drug is even manufactured by the State. That these developments will proceed further as time goes on seems inevitable. Whether we will or no, we are destined to an increasing development of governmental influence in matters of public health, what is even more significant, more and more subjects are going to be the concern of public-health officials. If this prediction be correct, what is the direction in which we should guide this development so far as it may concern pharmacology and drugs in general? The valiant efforts of the United States Food and Drug Administration and the Council on Pharmacy and Chemistry point the way. Constant education of the doctor and through him the lay public is the method chosen by the council. The Food and Drug Administration has been alert to pounce upon every violation of the law, defective as it is, even if the violator seemed unimportant so far as the extent of his operations was concerned. The tendency of many departments of public health, on the other hand, has been to expand facilities for medical care, when public education directed toward eliminating the waste of money on patent medicines might almost make unnecessary the provision of additional facilities for the "medically indigent." All the reports on the cost of medical care indicate that as much is spent in the United States for patent medicines as for all other types of medical service combined.

A first and most constructive step would be to remove from the class of medically indigent those who spend their hard-earned wages on patent medicines. How may this be done, and how does it concern public-health officials? It may be effected in two ways by education and by legislation. It is a paramount duty of health officials to teach the public the stupidity of self-medication, the evils of proprietary drugs and the dangers of patent medicines. The only agencies that have courageously attacked this problem are the Council on Pharmacy and Chemistry and the Food and Drug Administration, the latter is hampered by being a governmental agency. It is sad to see the lack of support in this vital campaign that is exhibited not only by the rank and file but even by the leaders and teachers in medicine, including those who hold advanced social views on the place of medicine in the body politic. These are the ones who perpetuate the use of proprietary names and thereby double the cost of medicine to their patients—money that could be used to relieve

the medically indigent. An indirect effect of this practice is the encouragement of self-medication and the consequent establishment of a relation between druggist and patient that indirectly makes the latter easier prey for the patent-medicine advertisement.

It seems unnecessary to emphasize this further. Illustrations will readily come to mind. Recent events have emphasized the great importance of adequate control of the marketing of newer drugs. Conscienceless manufacturers may introduce toxic substances without hesitation, and it is only by constant vigilance that public-health officials can prevent tragedies such as have lately occurred through the marketing of diethylene glycol as a solvent for sulfanilamide. The Food and Drug Administration and health officials throughout the country are to be congratulated on the rapidity with which they have traced all shipments of this nefarious mixture.

Mention of this incident suggests sulfanilamide as the most important single drug for discussion here. This substance has an interesting history in that it throws light on the practices that are perhaps not unknown in this country. The first reports of sulfanilamide were clinical ones made in 1933. The first experimental evidence that this substance was effective against streptococcal infections in mice was published in 1935, and the dosage then reported was not even remotely adequate according to later experiments. The chemical as originally introduced was complicated, and was protected by patent. To Marshall* belongs the credit of seeing immediately that the active agent which is split off from the compound in the body is a comparatively simple substance, sulfanilamide; it was first made in 1903 and consequently is not patentable. This rapidly supplanted Prontosil and Prontylin.

The introduction of this substance as a therapeutic agent illustrates another point where pharmacological advice is of value to the health officer. If his function is to advise the physicians of his district about new drugs, he can often secure information of possible dangers before clinical examples are recorded. In the case of sulfanilamide, there was a strong indication from the chemical structure of the drug that hemolytic effects should be guarded against, and likewise that granulocytopenia was a possible toxic manifestation. Changes in the hemoglobin were suspected as possible complications of its use. All these predictions by those familiar with the relation between physiologic action and chemical constitution have been borne out by subsequent events. It is interesting that some change in the color of the blood, the cause of which is not wholly clear, is an accompaniment

of adequate treatment. A new drug falls into disrepute, often undeserved, because of inadequate dosage, improper administration or use in improper cases. Briefly, at the present time, the indication for the use of this drug is in infections with the hemolytic streptococcus, the meningococcus and the gonococcus, and possibly in Type III pneumonia. It is common to find that it is tried, usually in inadequate doses, for all sorts of conditions which bear no relation to its now fairly well-established effectiveness.

As to the method of administration in adults, sulfanilamide should be given in divided doses totaling 3 to 5 gm. per day, preferably with an equal amount of alkali, or somewhat less, in the form of sodium bicarbonate, to avoid depletion of fixed base. Because of its activity in an alkaline medium it may be found to have some use as a urinary antiseptic in cases in which it is difficult to change the reaction of the urine to the acid side, and in certain types of urinary infection. It is apparently valueless against ordinary urinary infection with the colon group of organisms, which may be effectively treated with another newly introduced drug, the ammonium salt of mandelic acid. A definite public-health problem is involved in the use of sulfanilamide in the treatment of gonorrhea. With our lax laws it will unquestionably be sold freely for self-medication. It is conceivable that inadequate self-treatment may cause a tremendous spread of this disease. Certain symptoms associated with the administration of the drug may simulate mild alcoholic intoxication in ambulatory patients and thus provide a public menace in relation to the automobile.

Elixir of Sulfanilamide was produced by the S. E. Massengill Co., a pharmaceutical concern in Tennessee. The sulfanilamide was dissolved in diethylene glycol, and the results of its use provide a better experiment in toxicity than is usually seen in pharmacological laboratories, the recorded deaths constituting 100 per cent of those taking the mixture. The marketing of this preparation was absolutely indefensible, since it was shown in 1930 that the toxicity of diethylene glycol was approximately that of wood alcohol. Apparently, this mixture was distributed for sale not only without being tested but without even a casual investigation of the literature on the part of its makers. This ghastly experience indicates the danger of combining drugs in therapy without adequate pharmacological control of the mixtures, and the crying need for adequate legislation to control the marketing of all medicinal substances. Under the present law the only liability of this firm lies in connection with the use of the word "Elixir," which is defined as an alcoholic solution. In other words,

the firm cannot be indicted for manslaughter but only for misbranding.

Owing to limitations of time, I can do no more than touch on certain other drugs of particular interest to public-health authorities. In the malarial field, Atebrine, an acridine derivative, is valuable in destroying the asexual forms of the parasite. However, disturbing mental manifestations have followed its use. Plasmoquin, more closely related to quinine, has also been introduced as a complementary substance since it destroys the sexual forms. The use of ammonium salts of mandelic acid in pyelitis has proved very effective against the colon-typhoid group of organisms. Here again we must follow strictly the directions in the administration of this drug in order to get the results which have been obtained in the best hands.

It would not be satisfactory to conclude this brief survey without mentioning the pentavalent arsenicals such as Tryparsamide, Bayer 205 and Fournau 309. These were introduced against African sleeping sickness and would appear to be of little use in Boston but Tryparsamide has been found very effective against syphilis of the central nervous system, and since the Commonwealth of Massachusetts manufactures and furnishes arsphenamine, it may be that a compound similar to Tryparsamide may some day be distributed by the State.

Two other arsenicals of considerable importance to public health have recently appeared. Stovarsal, originally used for the treatment of amebic dysentery, is said to be valuable in the treatment of Vincent's angina. This disease presents a definite public-health problem, spreading largely through restaurants. Here is a distinct field for public-health authorities, in conjunction with pharmacologists, bacteriologists and clinicians, to investigate a substance that appears to be effective in a condition which is widespread and a source of economic loss.

A similar compound of arsenic, Carbarson, has been found sufficiently effective in amebic dysentery to merit a place with emetine. This disease, since the epidemic occurring at the time of the Chicago World's Fair, has become a problem of public health all over the country. Three other substances, Chiniofon, Vioform and Yatren, all chemically related to quinine, have also been introduced to combat amebic dysentery. The relative value of all these drugs is under discussion at present, and this attempt at evaluation should include the active participation of health departments with pharmacologists and clinicians, in order that the spread of this disease may be halted by adequate therapy.

I have given enough concrete examples to indicate the points at which the health officer meets

the science of pharmacology. It becomes obvious that the training of the health officer should emphasize this field to a sufficient degree to make him alert to its possibilities, in order that he may promptly seek advice on the many problems which may affect the public health. The health officer should preach constantly of the evils and dangers of self-medication and of the improper use of good drugs by physicians. Sulfanilamide provides an excellent example of the possible dangers of new drugs. It is almost certain that we have in this drug an addition to therapeutics which is of epochal importance, but at the very outset those familiar with the pharmacological literature were able to predict the probability of untoward blood reactions. New remedies introduced by substandard pharmaceutical houses should be carefully scrutinized. District health officers should have readily available adequate directions for the use of new drugs, so

that they may serve as a source of information for physicians in their districts, in the same way that they now see to it that the physician makes proper use of the various serums. Finally, distribution by the State of certain important drugs should be studied, if only as a threat to check the exploitation of the lay and medical public by unscrupulous manufacturers.

Let each of you preach to the public, to the legislators, to the manufacturer and to the practicing physician in season and out of season the necessity for the complete elimination of all proprietary, copyrighted names for medicaments and of all patent medicines. The control of this traffic is a function of government and of all interested in the health of the people. Education in this direction will ultimately by democratic processes force adequate food and drug legislation, eliminate these abuses, and reduce the cost of medical care.

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THE MEDICOLEGAL EXAMINATION OF HAIRS

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THE examination of hairs and other fibers is an important procedure in criminologic investigation, and deserves serious attention. In an appreciable number of criminal cases, human or animal hairs are a part of the corpus delicti, so that it may be necessary to examine them and appraise their significance as evidence. It is my purpose here to discuss the value of such hair examinations and also to point out their limitations.

A preliminary consideration of the normal hair growth is necessary before entering on this discussion. Hair is a specialized epithelial outgrowth of the skin which occurs everywhere on the human body except on the palms of the hands and the soles of the feet. The portion embedded in the skin is termed the root and that above the surface is known as the shaft, the distal end of an uncut hair shaft ends in a point, but if the tip of the hair has been cut, this end may be blunt, rounded or frayed. In their normal habitat, hairs are continually growing, reaching maturity and falling out, and new hairs are taking their places. In the same scalp, hairs in different stages of development are found side by side and show variations in length, thickness, shape and degree of pigmentation.

The most distinctive part of the hair is the shaft, which consists of cuticula, cortex and medulla.

The cuticula is the outermost covering and consists of one layer of non-nucleated polygonal cells which overlap like the scales on a fish, the free edges of the cells are directed toward the distal end of the hair. If a light-colored hair is examined microscopically in the dry state, the fine, wavy borders of the cuticula become visible. On human hairs, these markings appear as transversely elongated, polygonal figures which are said by some to be narrower than the cuticular markings on the hair of other animals. They have been suggested as an important criterion in hair diagnosis, but in my opinion are not satisfactory for that purpose, as the differences between the cuticular markings in the various mammalian species are not clearly defined.

The most characteristic portions of the hair are the cortex and the medulla. The cortex is the intermediate and the thickest layer of the shaft, and is composed of elongated, spindle shaped fibrils which cohere, they contain pigment granules in varying proportions depending on the type of hair. The medulla is the central canal of the hair, it may be empty or may contain various sorts of cells, more or less pigmented. Examination of the cortex and medulla yields the most reliable criteria in the diagnosis of hairs.

A systematic procedure should be followed in all hair examinations which have medicolegal importance. The person who brings the specimens to the examiner should identify them to him, and a

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record should be kept of the date, place and hour of this identification. If the case under consideration ever comes to trial, the evidence cannot be presented unless the hairs can be properly identified.

The next step is to examine the specimen with the naked eye or with a hand lens. The number of fibers should be noted and their length should be determined by actual measurements. When specimens contain a large number of fibers, the examiner should measure a sufficient number to determine their average length. The color, texture and other characteristics should be noted, and also any abnormalities which may be present.

The hairs should then be examined under a microscope in the dry state. If the strands are lightly pigmented, the cuticular markings are as a rule visible, and their character may be noted. The nature of any foreign substance which may be adherent to the hair shaft should be determined.

After this, the hairs should be cleaned with alcohol or some other solvent and mounted on a slide in xylol balsam. The nature of the specimen will determine the way in which this should be done but a set of rules cannot be devised to meet the problems set by every conceivable case. However the mount must be so prepared that the distal and the proximal ends of the hair can be examined and the general shape, thickness and characteristics can be ascertained without difficulty. The diameter of the shaft may be measured with a micrometer eyepiece, but I agree with Glaister¹ that the importance of such measurements can be overrated, inasmuch as the diameter varies considerably not only in different hairs in the same scalp but at different locations on the same hair. More reliable information can be obtained by comparing the hairs in the specimen with other human hairs in a collection.

Cross sections of hair are especially valuable and should if possible be made of every specimen, except in cases in which it is more desirable to preserve the whole mount intact. The most useful technic for this purpose is to wash the specimen in 95 per cent alcohol for five or ten minutes, to steep in a 10 per cent aqueous solution of sodium hydroxide until the hair is softened sufficiently, to wash in water a few minutes, and to place in 95 per cent alcohol for ten minutes. The length of time in which the hair should be softened by the sodium hydroxide must be determined by the experience of the examiner, but generally when the hairs show signs of losing their natural elasticity they should be removed from the alkaline solution. The hairs are now mounted for sectioning on a small cubical block of liver tissue which has been kept in acetone. A small slit is made in the cube

of liver along the length of one side, and the hairs are straightened out in the bed of this incision. The liver and the hairs are transferred to clove oil and allowed to clear, they are then embedded for twenty-four or forty-eight hours in celloidin which has been dissolved in equal parts of absolute alcohol and ether. The cube of liver tissue is placed on a wooden block in such a way that the slit and the hairs stand upright, and is then hardened for thirty minutes in a bath of chloroform. Cross sections of the liver and the hairs are made by the sliding microtome, and the sections are cleared in carbol-xylol and mounted unstained on a slide in xylol balsam.

Examination of such hair sections will determine the shape of the shaft in cross section, the relative size of the cortex and medulla, and the character and distribution of the pigment in the cortex. This procedure has the advantage of allowing several individual hairs to be examined in the same microscopic field. It is even possible to examine the same hair in whole mount and cross section by removing a piece from the whole-mount slide after the examination and sectioning by the process described above. A valuable method for comparing whole mounts or cross sections of hair is to join two similar microscopes with a comparison eyepiece and examine the specimens in the same ocular field. Photographs can be taken of the different specimens at the same magnification, which is an excellent and convenient method of demonstrating similarities of and differences between hairs from several sources.

An attempt should be made to answer the following questions in every hair examination: (1) Are the fibers hair or some other material? (2) If they are hairs, are they human or animal? (3) If they are human hairs, what is the race, sex and age and from what area of the body were they taken? (4) Is there any abnormality of the shaft, tip or root? (5) Can the hairs be identified as from a certain individual?

It is a comparatively simple matter to distinguish between hairs and other fibers which might be mistaken for them, such as cotton, wool, silk or straw fibers. All these materials present characteristic appearances of their own under the microscope, and any observer who is familiar with hair is not likely to confuse it with fibers of other types.

Animal hairs in most instances can be distinguished from human hairs if typical specimens of each kind are available for comparison. The diagnostic features are most suitably demonstrated by cross section, especially when dealing with dark hairs. When cut in this plane, human hairs present a circular, ovoid or almost flat outline. The medulla is smaller in comparison with the thick-

identity In one such case, a woman of advanced years held in her hands a tangle of gray hair which probably came from her own head, and a single light brown hair which was certainly not her own The hair of the defendant was similar to the single light brown hair, but the limitations of the examination would not permit any positive statement to the effect that they must have had an identical source The other evidence in the case was convincing, however, and the prosecuting attorney was able to propound a hypothetical question which limited those at the scene of the crime to the deceased and the defendant Under such conditions it could be stated with reasonable certainty that the brown hair in the hand of the deceased came from the head of the defendant because of its similarity, and did not come from the head of the deceased because of its dissimilarity

* * *

In general, the evidence which results from hair

examinations must be regarded as confirmatory, and should never be used unsupported by other proof The circumstances in each individual case must determine how valid will be the facts elicited from the hair examination

The most fitting person to perform examinations on hair is a medical graduate or a biologist of wide experience The study of hair is a specialized branch of histology, and of such complexity that long and painstaking application is required to master it It is important that the scientist engaged in this pursuit should prepare numerous specimens of human and animal hairs, both in whole mount and in cross section, and should make photomicrographs of the most typical specimens for the purpose of ready comparison

400 East 29th Street,

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PROGRESS IN DIABETES MELLITUS

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IN this article, it is our purpose to summarize the literature which has appeared since the review in the sixth edition of Joslin's *Treatment of Diabetes Mellitus* (Lea & Febiger, 1937) and in Chapter V of *Nelson Loose-Leaf Living Medicine* (Thomas Nelson & Sons, 1937)

INCIDENCE AND MORTALITY RATES

The number of persons with diabetes in the United States is growing This can be explained first by the increasing duration of life of the diabetic, which is perhaps the greatest factor, secondly, by the steady and rapid lengthening of life of the total population, the age at death being 41.9 years in 1920 and 48.7 years in 1930, thus approaching the ages of maximum susceptibility to diabetes, fifty-one for males and fifty-five for females, and thirdly by the wider recognition of the disease Urban rather than rural life, greater availability of food and reduction in physical exercise are more doubtful factors Evidence from two other sources indicates that there are more living diabetics about us today than ever before, that is, there has been a marked increase in the sale of insulin and of syringes, particularly those designed

for diabetics The estimate of the Metropolitan Life Insurance Company and the authors early this year was that there were between 400,000 and 500,000 individuals in the United States with diabetes, but all will agree that until new methods for the prevention of the disease are known these figures will rise

The proportion of new diabetics to total admissions to hospitals is cited as proof of this increase Such reasoning is not wholly logical unless one takes into account the decrease in contagious cases and in diseases more frequent years ago, balances with it the increasing tendency of patients to enter hospitals for diabetic schooling rather than for disabling illness, and bears in mind that two decades ago the patient lived only four or five years and now lives twelve or more, and so has six or seven more years in which to be counted as an admission to one or more hospitals

Diabetic mortality figures show increases both absolute and relative The figures per 100,000 for the United States changed from 16.0 to 19.0 to 22.2 for 1920, 1930 and 1935, respectively However, as indicative of what we may expect in the future, we cite Hoffman's rates of 21.4 per 100,000 for 184 selected American cities in 1930 and 27.8 for 187 cities in 1936 The rate for the five largest cities in 1936 was 31.2, for Boston in 1935 it was 35.0, and for New York City in 1936 it was 34.9 In four-

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teen Canadian cities in 1936 the average rate was 160, as compared with 13.3 in the Canadian registration area in 1935. Just as one can predict that the death rate of the country will approach that of the larger cities, so too can one feel confident that the rate in other countries will approach that in the United States. In fact, this change is proceeding most rapidly where the original rates were lowest. Italy as a country and Saskatchewan as a province of Canada show this equally well, as pointed out by Chase. She also finds that the distribution by decades of onset of the disease in Saskatchewan among her private cases is essentially the same as in New England among the authors' clientele, thus showing independence of environment. She reports that no case of diabetes was ever found among 1500 Indians whose urines were examined, and that the Inspector of Indian Affairs in Saskatchewan has never heard of a case of diabetes in a pure-blooded Indian. Teleky also has recently shown that the diabetic mortality rate for women in Prussia rose from 0.74 in 1877 to 8.1 in 1914 and to 19.2 in 1932. No doctor can afford to neglect serious study of the diabetic problem, because there are so many diabetics and they live so long.

Hoffman writes, "It is regrettable that diabetes is not a notifiable disease and that the number of diabetics in this country is only a scientific conjecture." We disagree with this opinion, if for no other reason than that the diagnosis of diabetes is sometimes difficult, especially for immediate decision.

Bolduan believes the low mortality in New York City in 1871-75—2.0 per 100,000—was due more to the non-recognition of the disease than to its rarity and recalls that chemical tests for sugar in the urine were not introduced until 1850 and were not routinely adopted until some decades later. That the rate for females was formerly low he attributes to the detection of diabetes in males through life-insurance examinations, this factor offsetting the actual greater prevalence among females which existed then as now. In this connection, Teleky records the extraordinary mortality rate of 1060 per 100,000 for females between sixty and seventy years of age in Prussia in 1931. We may expect the increase among females to continue for some time, Bolduan says until the rate becomes stabilized at a point which represents approximately the relative prevalence of the disease among the two sexes, he adds that the forty-five-years-and-over group is more than one-third greater than it was in 1900. Since 1900, at least one-third of the increase Bolduan believes to be attributable to the aging of the population. Part of the increase is due to the influx of Jews, in whom he says the disease is 50 to 75 per cent more prevalent. Allowing for these two factors, age and race, the diabetes mortality rate in New York City

among males shows a downward trend during recent years." He considers that 1 per cent of the population of New York City is diabetic and that "it is probably conservative to estimate the diabetics in the United States as over 600,000."

Despite the prevalence of diabetes [he writes], we do not find this disease among the five leading causes of death [in New York City] among males at any age period. It appears in eighth place in the age period 50-55, and does not rank higher than seventh after this. In females, on the other hand, diabetes is among the five leading causes of death at ages 55-64 years, and, after occupying eighth place at ages 40-44, it is never less than sixth place in the more advanced years.

In a recent publication from Washington, the frequency of ten leading diseases in poverty is mentioned, but of them, diabetes is the exception in that it did not progress with the extent of the poverty.

In 1935 diabetes mellitus was responsible for 3 per cent of all deaths of holders of industrial policies of the Metropolitan Life Insurance Company according to a recent report. It ranked ninth among the causes of death in this group, and if accidents and homicides are excluded, it ranked eighth. In recent years (1931-1935) the rate under ten years of age has been less than 2.0 per 100,000, rising to 142.2 for both sexes among white persons between sixty-five and seventy-four and to 305.2 for white women. The rates among Negroes have been less and the increases more rapid. The rate among white women, aged one to seventy-four, exceeded that among the men by 91 per cent, and among Negroes by 112 per cent, but the actual excess is virtually limited to middle and old age. Negroes are as prone to the disease as are Whites, and between the ages of ten and fifty-five the rates for negro women are higher.

For the last four years, the report continues, the death rate from diabetes as a whole has been constant, the maximum for any one year being 20.8 per 100,000. Among young persons, the trend has been downward since the discovery of insulin, with the exception of young Negroes, and here there has been a rise, as in older ages for all.

The increases are explained in part by the greater percentage of older people in the population, thus, between 1900 and 1930 the population at forty-five years or over more than doubled, but the total population grew by only 62 per cent. The female population at forty-five and over has advanced 110 per cent in thirty years. The shift of population from rural to urban centers, and the rapid growth of foreign immigration, including peoples peculiarly susceptible to the disease, have had as results a growing population susceptible to diabetes. The increase in the use of machines, which reduces muscular work, and the rise in the standard of living, are accessory factors, presumably because they

favor obesity. Also of great importance has been improved diagnostic technic. The growth of life insurance has naturally contributed to the discovery of new cases, for 4,000,000 persons in the last few years have annually applied for such insurance, requiring medical examinations, and the number thus insured is now about 30,000,000. Other points brought out are the growing longevity of diabetics especially of children, the reduction in the mortality due to diabetic coma and the shifting of causes of death to conditions incident to the age of the patients.

INSULIN

The use of protamine insulin has become widespread in the United States, largely because of the simplicity and ease of single dosage, making it advantageous not only in children but also in adult patients with milder grades of the disease. In general, those clinicians who have employed it extensively are most convinced of its value. Protamine-zinc insulin is the type authorized for sale and has displaced the original protamine insulin and its various other modifications. Patients hitherto untreated with insulin adopt its use most readily and seldom have difficulties, whether hospitalized or treated in the office. For patients brought up on regular insulin, the transfer to protamine insulin is often confusing, and for those whose meals must vary in time and quantity from day to day it may be impracticable.

Protamine-zinc insulin may act not only for twenty-four hours but in fasting patients for forty-eight hours or longer (Wilder, Sprague and Rynearson). Consequently the action cannot be expected to meet uneven demands such as the peak loads of meals. Similarly, its action is just as strong between meals when the glycogen reserves are lower. Therefore, for successful therapy meals must be spread far apart and luncheons inserted between them and particularly upon retiring, to guard against the night's fast, sometimes, indeed, it is safest to begin the day with the breakfast fruit and protamine insulin simultaneously. Contrasted to the procedure with regular insulin, in which the dose may easily be varied with the immediate needs, with protamine insulin the dose preferably remains unchanged but the carbohydrate may be shifted, as recommended by Ricketts, from one meal to another or the total carbohydrate for the entire day may be raised or lowered. Occasionally such alterations do not suffice and one is compelled to supplement the dose of protamine insulin before breakfast with regular insulin, the dose of the latter varying as a rule from one fifth to three fifths of that of the former. Seldom is the total dose of protamine insulin less than that of regular insulin which the patient may have been using.

Hypoglycemia Reactions to protamine insulin are, as a rule, less severe than is the case with regular insulin. They are usually accompanied by fatigue, nausea and headache along with the typical hypoglycemic symptoms, although the perspiration, tremor and palpitation are less marked. The patient may appear in a semi-dazed state with mental processes depressed. The hypoglycemia at times is asymptomatic, but may lead to marked and severe symptoms if, at such a period, the patient exercises. Symptoms may come on more unobtrusively than those due to regular insulin. At times the patient requires more than one dose of carbohydrate to secure relief.

"With protamine zinc insulin," says Sherrill, "the blood sugars may be maintained at very low levels, namely 0.03 per cent and 0.04 per cent, without symptoms of any kind." Attention is called to the recent experiments of Sherrill and MacKay, in which they report as follows:

Normal dogs die following prolonged hypoglycemia from a single or several injections of protamine zinc insulin. Heretofore it has been generally assumed and recognized that the hypoglycemia resulting from the use of regular insulin has proved entirely harmless if the blood sugar is returned to normal by the administration of carbohydrate or other food. No deleterious, residual injuries have been noted in man or animals. We have found that when fasted dogs are kept in hypoglycemic shock with occasional convulsions for twenty-four hours or more, some organic change is induced which prevents recovery and results in death, even though the blood sugar level is restored to normal and the fluid balance is adequate. We have used 6 normal dogs for experiments and death has resulted in each instance. As a rule, we have given a single injection of approximately a half unit of protamine insulin per pound of body weight. Subsequent smaller doses may be required to produce prolonged hypoglycemia. These dogs have been kept in a stuporous or comatose condition with blood sugar concentrations ranging from 20 to 30 mg per 100 cc. for from twenty-four to forty-eight hours. Carbohydrate was then administered either intravenously or by stomach tube and the blood sugar concentration raised to normal until death ensued. None of the animals regained consciousness. Some tissue or organ is apparently so damaged by the hypoglycemia or related reduction in glycogen content that death ensues, probably due to failure of the vascular system. No gross pathological lesions in the visceral organs or brain have been noted. Further experiments are in progress to determine the mechanism of this deleterious effect of insulin shock and the minimum duration of hypoglycemia which is dangerous.

As to whether the pathological lesions or chemical alterations which cause death in the dog are similar to and can be reduplicated in man is open to question. Nevertheless, the admonition at this time is expedient. Although the above animal experiments are convincing, hasty, adverse conclusions should not be arrived upon which might deprive the diabetic patient of the benefits which might accrue from protamine insulin.

Wilder's experiments with dogs given overdoses of protamine insulin resulted similarly. Multiple

petechial hemorrhages were found in the brain

In the course of studies designed to determine the effects of various diets, hydration, dehydration, and so forth, on convulsions caused by insulin in nondiabetic dogs, Corwin found that if an animal was given injections of insulin on successive days, its resistance to hypoglycemia decreased on the second day and decreased still further on the third. The resistance then became more or less stabilized so that on all succeeding days there was little if any variation in the response.

For clinical reasons Jordan emphasizes the importance of caution to avoid hypoglycemia in elderly diabetic patients who are taking insulin.

A diabetic who has an insulin reaction which puts in jeopardy the lives of others or his own makes it increasingly difficult for diabetics to secure employment, and brings nearer the day when the privilege of driving a motor will involve stricter physical and mental tests. Diabetics must not have insulin reactions, and this is one reason why we are satisfied if we can keep our severer diabetics 90 per cent instead of 100 per cent controlled. By this we mean that there is excreted in the urine no more glucose than 10 per cent of the actual carbohydrate in the diet. For this purpose the formation of glucose out of protein and fat can be disregarded. This paragraph is written apropos of the opinion of the New York judge who discharged a diabetic where the evidence showed he was having an insulin reaction at the time of the accident, but who, on the other hand, took away his license.

Sensitization Swelling and induration at the site of injection of insulin may occur and threaten abscess formation, but the latter seldom if ever develops. After a few weeks these local signs almost invariably disappear, and with the continuation of injections new ones fail to form.

Lewis points out that insulin protein is an active antigen and does not react in common with pancreas protein, that its specificity is independent of that of the major constituents of the pancreas, that it is without species specificity since it has no antigenic activity in common with other proteins of the same species, which are strongly species specific, and finally that insulin proteins from different animal sources are immunologically closely related.

Protein sensitiveness so severe as to prevent the use of insulin has been extremely rare in Umber's clinical experience with 8000 diabetics. Generally, sufficient prophylaxis is given by injecting 4 units twenty minutes before the regular insulin injection. Stötter, from Umber's Clinic, thinks that if he had used the method of Lasch and begun with a dilution of 1:100, the result would have been fatal in his patient, who had a history of protein sensitivity and hay fever in 1916, and sensitivity to

peptone in 1919. An attempt at desensitization almost caused death. In 1931 diabetes was diagnosed, in 1932, following the administration of staphylococcal autovaccine, the patient had an allergic reaction of extraordinary severity, the blood on the next day showing 6,600,000 red cells and 9 per cent eosinophils, in 1933 there were two more reactions to peptone. The patient entered the Umber Clinic in July, 1936, with a urinary excretion of 66 gm of sugar in twenty-four hours and a blood sugar of 280 mg per cent. Desensitization was begun with intracutaneous doses of 0.1 cc of a 1:1,000,000 dilution, but the reaction proving positive, with marked local and later general symptoms, the dilution was changed to 1:10,000,000,000 and was gradually increased. The patient was kept on a protein-free diet for about a month. Within one month he could take 0.5 cc. of a 1:1000 dilution. After two months the diabetes was controlled with 12 units twice daily. Special precautions were taken to preserve the crystalline insulin used, to keep it free from contaminating protein. Eventually the patient was wholly desensitized against insulin, and incidentally, peptone sensitiveness also disappeared.

Methods A multitude of articles upon protamine-zinc or calcium insulin has appeared. Joslin summarized and commented upon his results in over 1250 cases. Emphasis was laid upon the desirability of reverting to the Naunyn era and comparing carbohydrate intake with glucose loss. If with modern diets containing 150 gm of carbohydrate only 10 per cent, or 15 gm, appears in the urine, the case can be considered fairly well controlled. With complete sugar freedom, there is danger of reactions unless the days are planned with remarkable uniformity. The zeal of patients to keep sugar-free throughout the twenty-four hours, however, is a welcome contrast to their former indifference to their tests.

Wilder demonstrated the importance of insulin in protecting the proteins of the body from catalysis. This may account for the better health and apparent increase in carbohydrate tolerance of patients taking protamine insulin. Wilder also found an initial dose of protamine insulin along with regular insulin of decided value in the treatment of diabetic acidosis.

Most writers, including Sherrill, stress the better control of patients under protamine insulin and its value in reducing hepatomegaly. Greenhouse also noted improved carbohydrate tolerance, which he quite correctly writes "may be ascribed to the stabilized carbohydrate metabolism made possible by the continued insulin effect maintained by protamine zinc insulin." Richardson gives good working rules for its employment.

Humsworth finds that the new protamine insulin compounds act so slowly that they are ineffec-

tive in suppressing alimentary hyperglycemia, and that it is therefore often necessary to give auxiliary injections of quickly acting insulin

Evidently Whitehill and Harrop have realized the difficulties of protamine insulin for the careless or erratic diabetic, for they write "Individuals with moderately severe diabetes who will not submit to a careful, regular dietary regime will find the use of regular insulin safer and, on the whole, more satisfactory." They also note the variability and unpredictability of its action. Gray, Bischoff and Sansum report favorable results with histone insulin, which because of its slow and prolonged action they consider particularly useful in patients with severe diabetes, in juvenile patients and in elderly ones with cardiovascular complications. No local or systemic reactions were noted. The total unit requirement was the same or less than that with regular insulin. Instead of 27 injections per day of regular insulin, the number has been reduced to 1.2 injections of histone insulin.

With children especially, says Joslin, protamine-zinc insulin has been welcomed, although with the large majority, regular insulin has also been necessary. Newcomb, Dick and Schnute urge the importance of adjusting the meals and carbohydrate intake so as to prevent reactions when children are taken home from the hospital. Children were said to have fewer periods of intense hunger than adults and to be more active and alert. Favorable results with children were noted also by Drysdale, who believes protamine insulin especially efficacious in preventing diabetic acidosis in juvenile diabetic patients suffering from respiratory infection.

According to Sindoni, "protamine insulin, if indicated, should be given on retiring and, if necessary, after breakfast, immediately following the ordinary insulin, which is given within from fifteen to twenty minutes after meals."

Resistance From time to time, cases have been reported which have shown most of the symptoms and signs of diabetes but which did not respond to insulin in the usual fashion. An extraordinary case treated by Mason and Sly was that of a white boy, twenty-five months old, who was found routinely to have low fasting blood-sugar values and who exhibited glycosuria and an abnormal rise in blood sugar following the ingestion of dextrose-containing carbohydrate. The ingestion of isocaloric amounts of levulose or galactose, or large amounts of protein or fat, caused much less rise in blood sugar and little or no glycosuria. The patient exhibited little or no response to insulin. The glycosuria could always be stopped by the substitution of levulose or galactose for dextrose in the diet. The authors suggest that the difficulty in this case was caused by a marked lessening of the liver's ability

to convert dextrose to glycogen or to an intermediary product in this conversion.

Himwich and Fazekas hold that resistance to insulin is developed during infections. The effects of the disease in stimulating the endocrine glands and the nervous system result in a rise in blood sugar, counteracting the effects of insulin, whether endogenous or injected. It is the infection, not fever, that is the potent factor in the development of insulin resistance. Insulin resistance, experimentally produced by diphtheria toxin injections, results from an increased activity of the sympathetic nervous system which favors glycogenolysis. Insulin resistance does not appear to be due to antibodies, for antitoxin creates no insulin resistance. The mobilization of carbohydrate in response to the emergency of infection, although ordinarily a defensive reflex mechanism, becomes injurious in diabetes. Thyroxin and the anterior pituitary hormone also counteract effects of insulin. Diphtheria toxin exerts a direct necrobiotic effect on the islands of Langerhans and the cells of the liver. The chief factor in insulin resistance, however, is hormonal antagonism. Ergotartrate in large doses may inactivate the mechanism of insulin resistance. Denervation of the adrenal gland is not to be considered. Combating the infection is the most logical treatment. Standard insulin, with its more intense and rapid action, is preferable to protamine insulin in cases of acute infection.

Technical Sahyun, Goodell and Nixon found that a preparation of insulin low in ash and free of copper, iron and zinc was unstable when incubated at 52°C for at least one week. At the end of nine weeks' incubation at this temperature the insulin had lost 50 per cent of its physiologic activity. However, 1 mg of zinc to every 1000 units resulted in a preparation which was quite stable at a temperature of 52°C for seven weeks, and at the end of nine weeks' incubation at this temperature the sample had lost only 10 per cent of its physiologic activity. The addition of zinc in the amount of 1 mg to 1000 units did not cause either a delayed onset or a greater duration of the hypoglycemic effect of the insulin.

Miscellaneous Kantrow and Boyd gave 0.25 units of insulin per kilogram of body weight to children and determined the blood sugar before and at half-hour intervals afterward. In the non-diabetics the maximum fall in blood sugar occurred in the first half hour, whereas in diabetics the effect was prolonged.

Major and Delp found in tests carried out on both rabbits and human patients that inconstant but at times marked decreases in blood sugar might follow the cutaneous application of insulin.

HYPERINSULINISM WITH PANCREATIC TUMOR

White and Gildea report the case of a woman of thirty-two with symptoms of hyperinsulinism which were shown subsequently to be secondary to an island-cell adenoma of the pancreas. This adenoma was unusual in that it was calcified and was found outside the pancreas in the surrounding tissues. Before the operation it was noted that the patient responded more favorably to a high-carbohydrate, low-fat diet than to a low-carbohydrate regime. The threshold for the development of symptoms of hypoglycemia was not appreciably affected by the administration of large amounts of alkali or acids. No direct relation was demonstrated between emotional tension and the onset of symptoms.

Herrmann and Gius report the case of a man of forty-eight who suffered attacks of spontaneous hypoglycemia. The striking feature was that at operation instead of a pancreatic adenoma or a calcareous mass was found. No pancreatic tissue was found by the pathologist in the material removed at operation. Careful studies at intervals following the operation showed entirely different glucose-tolerance tests than before operation and the symptoms of the hypoglycemia did not recur.

DIET

The problem of diet continues to be discussed from the point of view of the etiology of diabetes as well as from that of therapy. Bertram emphasizes the use of high-carbohydrate, low-fat diets. He, like Süsskind, believes that the increase in diabetes is due to increased consumption of fat by civilized man and to obesity itself. Of the men who were 25 per cent overweight, 49 per cent owned an automobile and therefore took little exercise, and 74 per cent were guilty of greater or less abuse of alcohol. However, in 49 per cent of his cases there was diabetes in the family. An important point is that Bertram believes that the occurrence of diabetes is not conditioned by the hereditary anlage but is in reality due to exogenous factors.

Vesa studied 23 diabetic patients between the ages of seventeen and sixty-five. Blood and urine samples were examined for sugar hourly from 8 a. m. to 8 p. m. on successive days. He found that the taking of pure olive oil did not in any case cause an elevation of the blood sugar higher than the control sugar curve obtained in fasting, in fact, in some cases the blood sugar fell during the course of the day more rapidly than during a similar period when fasting. Furthermore, the amount of sugar in the urine was often smaller when fat had been taken than when the patient had had nothing to eat.

After the taking of meat the daily blood-sugar curve almost paralleled the fasting curve, although in some cases it was on a slightly higher level. The giving of meat did not cause any hyperglycemia, it merely caused the blood sugar to fall more slowly in some cases when compared with the fasting curve. The amount of sugar excreted in the urine after meat was somewhat greater than that during the period of fasting.

The author concludes that fat and albumin probably affect metabolism during the course of the entire day and that the ingestion of pure fat and albumin does not need to stand in any direct relation to the time of insulin medication.

The relations of the vitamins to carbohydrate tolerance must be considered of some importance since, as Umber points out, both vitamins and hormones act as catalyzing agents which regulate chemical changes in the living cell. He emphasizes the fact that one may have a purely functional disturbance in the pancreas gland of a most serious nature without any demonstrable pathologic change, not merely in relation to diabetes but in relation to the other functions of the pancreas. He illustrates this with the case of a woman of fifty-four who suffered loss of weight and fatty stools, with a loss of 75 per cent in ingested fat in the stools, development of aplastic anemia and at autopsy an entirely normal pancreas. Similarly, this condition of the pancreas can be produced in hyperthyroidism. He holds that diabetes almost never follows an infected, necrotic pancreatitis unless there is a constitutional deficiency. He cites a case, however, in which he believes that diabetes did follow some years after an acute gangrenous pancreatitis in a woman of twenty-six. He believes on clinical grounds that functional inflammatory or neoplastic lesions in general affect only the external secretion of the pancreas. The island apparatus is extremely resistant against all exogenous pancreatic injuries unless there is a constitutional deficiency.

A direct connection between diabetes mellitus and vitamin A is unknown, according to Schroeder. Carotene, as well as vitamin A, is found in diabetic blood serum, but during diabetic coma both disappear. In view of the antagonism between vitamin A and thyroid secretion, it seems likely that carbohydrate metabolism is indirectly influenced by vitamin A. Although vitamin B has no direct effect upon blood-sugar content, he could demonstrate a slight improvement in carbohydrate tolerance by giving pure vitamin B. Lactoflavin injected intravenously reduced the blood sugar of diabetic patients by 20 to 30 per cent. Also the intravenous injection of 300 mg. cevitic acid (vitamin C) reduced the blood sugar of normal indi-

viduals, perhaps by inhibiting the insulin antagonist, thyroxine. That vitamin D is involved is proved by the fact that ultraviolet irradiation brings about reduction of the blood and urine sugar in diabetic patients.

Stueck, Flaum and Ralli determined the serum carotene in 13 diabetic patients with clinical evidence of carotenemia and found it to be above normal in all. The average for the group was 0.39 mg per cent. The photoelectric colorimeter was found to be a convenient and accurate instrument in the determination of carotene.

Aszodi and Mosonyi by intravenous administration of vitamins B and C caused an increased secretion of insulin in dogs' blood. In dogs without a pancreas, vitamin C caused only a slight fall of blood sugar, which presumably came from a nervous restrictive mechanism. With dogs with bilateral division of the vagus the insulin secretion was very slight or none at all, this showing a peripheral point of attack of vitamin C. Sigal and King produced in guinea pigs a lowering of carbohydrate tolerance as measured by blood-sugar content when the pigs lived on a diet low in vitamin C. This tolerance returned to normal, however, when the vitamin C was added to the diet.

Gradually, methods for quantitating vitamins are becoming more generally available. Helmer determined vitamins B (antineuritic) and G (lactoflavin) in the human urine by the rat-growth method.

CURE OF DIABETES

Glassberg presents the case histories of 5 patients in whom a diagnosis of "cured diabetes" seemed proper to him. In 4 of the 5 "cured" cases reduction in weight accompanied the increase in tolerance. One gathers that the patients did not show symptoms of diabetes mellitus but that the condition was diagnosed originally by glucose-tolerance curves. The cure was assumed because of the fact that the tolerance curve subsequently became normal. In the discussion Olmsted pointed out that diagnosis by means of tolerance curves, although at the present the only means at our disposal in addition to the evaluation of symptoms, is fraught with danger because of the fact that arbitrary standards must be maintained.

The authors of this review have never encountered a case diagnosed not only on the basis of an abnormal glucose-tolerance curve but also on that of the typical symptoms of polyuria, polydipsia, pruritus and loss of weight and strength which has subsequently failed to show diabetes. The apparent clearing up of the disease which is often seen

in mild diabetic patients who have carefully followed treatment is often shown to be misleading by the intervention of some complication such as an infection with fever, during which time the diabetes once again becomes evident in full force and hyperglycemia and glycosuria reappear. We feel that the following criteria for cure still hold

Diagnosis. The diagnosis of diabetes shall be based upon a glycosuria of 0.5 per cent or more, accompanied by a fasting blood sugar of at least 140 mg per cent or a venous blood sugar after a meal of at least 170 mg per cent.

Duration of Proved Diabetes. The duration of proved diabetes, by repetition of the tests described under diagnosis, shall be recorded in months. By this plan the individual can be classified as a proved diabetic of one or more months' duration. The longer the duration of the proved diabetes, the greater the importance which will be attached to its cure. Chance glycosurias and hyperglycemias resulting from errors in the laboratory, from operative procedures and from temporary infections are thus ruled out. Hyperthyroidism and hyperpituitarism are not excluded, and therefore a statement concerning these conditions should be included in the report of the case.

Test for Recovery. Glycosuria and hyperglycemia shall be absent while the patient is without diabetic medication, both before and an hour after a meal. This meal must contain at least two fifths of the carbohydrate for the day. The carbohydrate for the twenty-four hours shall comprise at least two thirds of the calories necessary to provide 30 calories per kilogram of body weight. Better still, the carbohydrate tolerance shall be unimpaired as judged by a normal glycemic curve following the oral administration of 50 to 100 gm. of glucose to the patient in the postabsorptive state.

Establishment of Recovery. A proved case of one or more months' duration, which conforms to the test for recovery at the beginning and end of an interval of five or more years, shall be considered cured.

ACIDOSIS

The hopes raised by the announcement that succinic acid might prove a valuable therapeutic agent in preventing or treating diabetic acidosis seem to have been false. Dunlop and Arnott found that this substance had no effect in preventing the onset of diabetic coma or in diminishing a chronic diabetic ketonuria. Unfavorable results have also been reported by Lawrence and by Dibold, Frey and Lapp. The latter found no effect exerted upon the acetoneuria in healthy people or in diabetics. Reference should be made also to articles by Koranyi and Szent-Gyorgyi and by Pocza.

Deuel, Murray and Hallman conclude that succinic acid is ineffective in preventing the ketonuria in fasting rats previously fed a high-fat diet, even when this acid is administered in amounts far in excess of the quantity of glucose required to produce a marked decrease in the excretion of the ketone bodies.

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and nondiabetic children by Hungerland brings out two opposing points of view, one favoring and the other disapproving the use of insulin in non-diabetic children with ketonuria due to vomiting. The important point is not to miss the diagnosis of diabetes. While carbohydrate feeding may be sufficient treatment in nondiabetics, it is not enough for the diabetic child in coma.

ENDOCRINOLOGY

The demonstration by Young that experimental diabetes can be produced in a dog by injections of large amounts of an extract obtained from the anterior lobe of the pituitary again centers attention upon the pituitary gland in relation to diabetes. Working at the National Institute for Medical Research at London, Young administered daily twenty-six and twenty-one days, respectively, anterior pituitary extract to 2 dogs by the intraperitoneal route, as a result, they became diabetic and remained so after the injections were stopped, without showing any signs of recovery. A third animal similarly treated became only temporarily diabetic. The permanent diabetes thus produced differed from that of depancreatized dogs in that the pituitary treated dogs appeared to be able to survive without insulin, retaining vigor, and in 1 case there was no loss of weight. The extract was prepared from fresh ox anterior pituitary glands, and all the procedures for extraction and preparation were carried out at temperatures approaching 6°C. In 1 dog, the extract from 490 gm of ox pituitary was used.

In 1 dog of his series, four weeks after the cessation of injections, the sugar excretion was 264 gm (24 gm per kilogram) a day. The fasting blood sugar at the end of forty-eight hours was 256 mg per cent. This dog became diabetic in September, 1936, and insulin was not given until March, 1937. Death occurred in coma on the sixth day after insulin was discontinued, and nearly ten months after the pituitary injections were discontinued. At autopsy, the liver was large and fatty, weighing 1030 gm., and the pancreas weighed 52 gm.

Young's experiments are epoch making. They mark the first successful production of diabetes by methods other than pancreatectomy, and furthermore, the first instance in which a chronic metabolic disease has been produced experimentally by the injection of material obtained from normal glands.

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The question often raised as to the possible benefits in diabetes of giving x-ray treatment to the pituitary is apparently answered rather completely by the studies of Pijoan and Zollinger. They studied the carbohydrate metabolism of patients undergoing massive radiation of the pituitary regions (because of the menopausal syndrome) before and after the radiations. Ten patients whose ages varied from twenty-nine to fifty received a total of 1400 to 1600 r skin doses over a period of fourteen days. Their blood-sugar curves were obtained after the oral administration of 1 gm of dextrose per kilogram of body weight, in a second series of experiments the blood-sugar values were determined after the intravenous administration of 0.35 units of insulin per kilogram of body weight. Neither set of experiments showed any essential difference between the curves obtained before the radiation and after it. In 1 case the changes in the respiratory quotient were observed after dextrose and after insulin and again perfectly comparable curves were obtained. Pijoan and Zollinger conclude that such radiation of the pituitary gland caused no change whatever in carbohydrate metabolism. In commenting upon these fundamental observations, one would say, first, that a priori no very marked change should be expected in the function of a gland treated with clinical doses of x-ray in which the cells are of the normally differentiated type. It is really only in cells of new growths in which the differentiation of cell structure has not reached its final stage that irradiation may be expected to disturb the function. However, even in some such tumors of the pituitary the evidence that radiation produces any very great change is somewhat contradictory.

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patient, a non-diabetic, the sugar-tolerance curve was greatly elevated by the giving of thyroid extract. When the metabolism once again fell to —22 per cent the blood-sugar curve went back to normal. Labbé holds that the frequency of exophthalmic goiter in diabetes is too great to be a mere coincidence. He feels that many cases are to be regarded as a true thyroid diabetes dependent upon a disturbance in thyroid glycoregulation, and differing from the ordinary pancreatic diabetes. However, in our experience among diabetic patients in whom the diagnosis of diabetes was clearly dependent upon hyperglycemia, glycosuria and a characteristic history, the fundamental severity of the diabetes has not been affected by operation upon the thyroid. Temporary severity, even acidosis, is helped by the reduction in metabolism following operation. Furthermore, at autopsy those cases have shown changes in the pancreas similar to those found in cases of diabetes without thyroid complications.

Meythaler and Mann found in both hyperthyroidism and myxedema a marked sensitiveness to insulin. (The patients studied were nondiabetics.) The authors explain this apparent contradictory finding on the basis of an altered functional status of the sympathicoadrenal system. Although hyperthyroidism is associated with an increased, and hypothyroidism with a decreased, sympathetic tonus, the response to insulin is the same, since in the former condition there is glycogen lack (due to hyperfunctioning of the sympathicoadrenal system), and in the latter normal glycogen content of the liver (due to hypofunctioning of the sympathicoadrenal system). An overproduction of adrenine in the presence of glycogen lack is without effect, while on the other hand rich glycogen stores, as in myxedema, represent a useless depot since the mobilizing agent, adrenine, is not present in sufficient amounts.

Fazekas, Himwich and Martin ligated the lumbo-adrenal veins of 8 cats distally and proximally to the adrenal glands, and at the same operation removed the entire pancreas. The animals were maintained without insulin or cortin. The survival period of the animals was definitely prolonged by the ligation, and 1 animal lived ninety-eight days. These experiments should be considered in relation to Long's demonstration of the ameliorating effect upon diabetes in depancreatized cats produced by adrenalectomy. Suggestions of the clinical effects of the adrenal gland are made by Langfeldt, whose patient, a man with melancholia, had moderate sensitiveness to insulin following an opium cure. He developed coma with 72 units of insulin. Langfeldt raises the question whether opium depresses the production of adrenine.

PHYSIOLOGY

The significance of the variations in the sugar content of other tissues of the body besides the blood is receiving study. An example is the study of the sugar in the skin previously reported by Urbach. Greif states that the sugar concentration of the marrow of the sternum is regulated within certain bounds independently of the blood sugar, and that its percentage represents the sugar formed locally in the tissues. The fasting values in 21 healthy subjects were between 39 and 155 mg per cent. At times (12 cases) the sternal-marrow sugar was very different from the blood sugar. Sometimes it was lower and twice it was higher than blood sugar, a fact which suggested autochthonous regulation. To various tolerance tests with glucose, adrenalin and insulin there were similar variations in sternal-marrow sugar as with blood sugar, but of quite independent character, at times being later or earlier than with blood sugar, and at times showing divergencies in the curves.

LIVER

The early demonstration of Minkowski that the liver exerts the power of transforming levulose into glycogen is referred to by Paisseau, Ferriar and Mangeot, who report another case of levulose in a child of five. They state that there is no experimental evidence that insulin improves the metabolism of levulose. The reduction in the size of the liver in diabetic children as brought about by insulin in controlling the diabetes is more important than other measures. However, Eder and Gray successfully treated 5 such children with iron. They felt that the iron treatment was the main reason for the reduction in the size of the liver. Rathery and Froment, in reporting the case of a woman with gallstones, discuss the possible causation of diabetes by inflammation of the head of the pancreas along with gallstones. However, in their case little evidence of inflammatory effect either in the liver or the pancreas was found.

Terbruggen in diabetic patients under fifty noticed no disease of the gall bladder. He holds also that the concurrence of diabetes with gallstones is not so frequent as to suggest a causal connection between the two.

Bridge utilized the respiratory quotient in a study of the glycogen reserve of the liver and the muscles in rabbits. At present there is no known way of estimating the glycogen reserve of either animals or human beings. Without doubt, in the future some method of determining the glycogen reserve will be found, and it will have an important place in the clinical study and treatment of patients. Bridge's rabbits in general showed a high fasting respiratory quotient, correlated with

rich glycogen reserves in the liver. On the other hand, the content of the muscle glycogen as determined immediately after death was not so clearly correlated with the respiratory quotient. These results were somewhat surprising in view of the fact that muscles constitute about 45 per cent of the total weight of a rabbit, and should have a correspondingly predominant influence upon the respiratory quotient. On the other hand, the liver which represents only 4 to 10 per cent of the total weight, could hardly be expected to dominate the combustion in the body as it seemed to do in these rabbits.

The influence of other endocrine glands upon glycogen metabolism in the liver is receiving increasing attention.

In a brief communication Young reports that the livers and possibly the muscles of fasting rabbits injected with extracts of fresh ox (anterior lobe) pituitaries contained more glycogen than similar tissues of control animals. He suggests as an explanation that in the injected fasting animals glycogenesis proceeded at an increased rate.

Raab and Strauber obtained blood-sugar curves in 12 normal individuals, in 12 diabetic patients and in 10 patients with catarrhal jaundice, following each of two consecutive injections of 0.5 mg of adrenalin at intervals of two and a quarter hours. Furthermore, tests were carried out on 5 normal individuals and 5 with catarrhal jaundice, after each of two administrations of 50 gm of sugar at intervals of one and a half hours.

In all the normal individuals, following the giving of adrenalin and sugar, the second curve was lower than the first. In the diabetic patients, the effect of the first adrenalin injection was greater. Usually the peak of the second adrenalin curve lay higher than the first, but the absolute size of the second curve was on the average lower than the first, as in the normal cases.

In the cases of catarrhal jaundice the fasting blood sugar was normal. The effect of the first injection of adrenalin was somewhat decreased, but that following the first administration of sugar was increased. The second adrenalin peak lay, in contrast to the normal, without exception higher than the first, the absolute size of the second adrenalin effect remained on the average a little less than that of the first, as in the normal cases, in a few cases it was even greater. The peak of the second sugar-tolerance curve lay, in contrast to the normal, much higher than the first, the absolute size being on the average smaller than the first and smaller than in the normal cases.

The results in the diabetic patients were attributed by these authors on the one hand to lack of insulin and on the other to a disturbance of

glycogenesis. In explaining the results obtained in catarrhal jaundice it was assumed that there was a diminished capability of the liver cells for taking up sugar, and in addition an intact and even increased intrahepatic metabolism of sugar taken up and a mild insufficiency of the pancreatic island apparatus. An increased sensitiveness to adrenalin does not exist in catarrhal jaundice, either in connection with blood sugar or with blood pressure.

The peculiar tendency for fat to be moved from other tissues and to be deposited in the liver has been a fundamental characteristic of diabetes. Kaplan and Chaikoff, working with completely depancreatized dogs, compared the fatty acid content of a mixed sample of entire liver with that in its lobes and in sections of them. The values obtained by these three types of sampling showed that fatty acids were not evenly deposited in the liver as fat accumulates. Because of this these authors point out that it is not fair to employ lobes and sections of lobes in estimating the fatty acid content of the whole liver.

Kaplan and Chaikoff found that it required a period of at least sixteen weeks to ensure a consistent finding of fatty acids in excess of 14 per cent in the livers of completely depancreatized dogs. Furthermore, if completely depancreatized dogs survive long enough, spontaneous regression of the fatty livers may occur despite the absence of raw pancreas in the diet during the entire period. The authors found that the ingestion of raw pancreas prevented the infiltration of fat in the livers of depancreatized dogs. They report that this factor is heat-stable in contradistinction to the heat-labile factor in the pancreas, which, when it is ingested by completely depancreatized dogs being maintained with insulin, produces an elevation in blood lipids above the normal.

Kaplan and Chaikoff maintain that although choline when given to completely depancreatized dogs influences deposition of liver fat, its curative action is slow, and daily feeding for a long time is required to produce measurable effects on livers in which large amounts of fat have accumulated. Furthermore, the authors find that choline does not raise the blood lipids in depancreatized dogs above the normal level, and in conclusion say that the pancreatic blood-lipid factor is therefore not choline.

In this connection, it is relevant to cite the views of Best, who does not maintain that the sole potent factor in raw pancreas is choline. Indeed, he recognizes four possible influences: choline as such, the protein of raw pancreas which in itself has a lipotropic action, pancreatic enzymes which by

their action may release more protein and choline, and the possible presence of betaine and other substances in raw pancreas which in addition to choline may possess lipotropic activity

CARBOHYDRATE METABOLISM

Meythaler found that the regulation of carbohydrate metabolism during athletic exercise depends above all upon training. The more in training an individual is, just so much more efficiently does he store glycogen in his depots. Since we know that trained animals, even after activity which is completely exhausting, still possess a considerable amount of glycogen in the liver, it is improbable that pure glycogen deficiency is responsible for the different course of carbohydrate metabolism in sport. The factor of glycogen lack is at most to be considered in extreme activity as in marathon races. Rather, Meythaler believes that his results have shown above all that the different course of carbohydrate metabolism in sport is related to the different demands of the sympathicoadrenal system. Training implies an adaptation in the periphery to increased capability of action, which in turn depends presumably upon an increased activity of the vegetative nervous system. In the last analysis, the efficiency of the sympathicoadrenal system governs the degree of capability in a highly trained condition.

Sheldon, Johnston and Newburgh, using a respiration chamber, found that 3 normal, male, fasting subjects oxidized increasing amounts of glucose in response to increasing quantities of carbohydrate in the preparatory diet (used for three or more days prior to the day of the test). Furthermore, the subjects oxidized more glucose during the four hours of the test in response to increasing amounts of glucose ingested at the beginning of the test, even though the preparatory diet had been the same. The effect was additive when both sources of carbohydrate were increased simultaneously. The response of 3 male diabetic patients was qualitatively similar but quantitatively smaller. The ability of the diabetics to oxidize glucose was directly related to the severity of the disease. Carbohydrate, in excess of the ability of these diabetics to oxidize it, was of no benefit.

The interpretation of glucose-tolerance curves is often puzzling, especially in the presence of some complication. Peskin describes a small group of patients with symptoms in many respects similar to those of peptic ulcer, but in whom upon roentgenological examination no ulcer could be demonstrated. The author outlines the various criteria which distinguish this condition from true peptic ulcer, chief among these being the extraordinary

response to the giving of 50 or 100 gm of glucose by mouth. Instead of the usual blood-sugar curve obtained in the nondiabetic individual, the curve takes on a definitely negative characteristic, the blood sugar, instead of rising, descends to a low level (in the published curves, to as low as 50 mg per cent), and then gradually ascends, although never attaining normal. These patients possess a high metabolic rate and show the symptoms of tachycardia, — excessive sweating, tremor, nervousness and eye symptoms, — suggesting a thyroid abnormality. Successful treatment consisted in placing the patient on a diet poor in carbohydrate and protein and high in fat.

Deren studied the dextrose tolerance of 50 subjects over fifty-five years of age without complications. One half of the group were studied with the ordinary 100 gm dextrose-tolerance test, and in 16 a high prolonged curve was observed. In only 4 were normal blood-sugar curves observed. With the one-hour, two-dose method of Exton and Rose there were 21 diabetic and 4 normal types of sugar curves. This seems an extraordinarily high percentage and should encourage further study in this field.

Bergman and Drury found that the rate of utilization of glucose by eviscerated rabbits was affected by feeding and fasting prior to operation. The tissues of the fed animals utilized glucose at a rate double that of the fasted rabbits. The authors present evidence to show that this increase cannot be due to insulin but is rather due to some other influence, possibly that of the pituitary.

METHODS

Rhodehamel, Rose and Chen report the development of a simple and rapid method for determining sugar in the urine, and describe in some detail the apparatus needed and the method followed. The method is based upon that previously described by Sheftel, which depends upon the fact that the cuprous oxide formed by reduction takes on a yellow instead of a red color in the presence of a sufficient amount of creatinine and a hydrophilic colloid such as acacia. The yellow cuprous oxide forms different shades of color from green to yellow, with an excess of blue cupric ions, depending upon the amount of sugar present. A colored chart is used, the colors corresponding to various concentrations of glucose.

Greeley describes a method for complete pancreatectomy in the rabbit. His method calls for a three-stage procedure with three to four weeks between operations. Blood-sugar values in animals so depancreatized (fed without insulin) remained at a level of 400 to 500 mg per cent.

NERVOUS SYSTEM AND DIABETES

The varied manifestations and clinical relation of hypoglycemia concern the psychiatrist and surgeon as well as the internist. The present attempts to treat schizophrenia and other psychoses by means of hypoglycemia induced by large doses of insulin afford the opportunity to witness many interesting neurologic manifestations, which according to Golden have not been described as arising as complications of diabetic treatment or symptoms of pancreatic adenoma. These may be classified as follows:

Prolonged manifestations, occurring for a longer period during the four to five hours of treatment

Quick jerking movements of arms, legs and body and restless tossing of the head

Prolonged sucking movements of lips

Episodes initiated by flushing of face, dilation of pupils and labored breath, with rigid extension of lower extremities, bilateral adduction and extreme internal rotation of rigidly held arms, clinically suggesting decerebrate rigidity

Partial manifestation of the above, the legs remain normal.

Irregular, thrashing, apparently purposeless movements of the arms and legs, suggesting true defense reflexes

Deep reflexes difficult to evaluate. Occasional Babinski and disappearance of corneal reflex

Slow trombone like movements and irregular jerks of tongue after other clonic movements

Extremities showing frozen athetoid movements

Transitory hemiplegias

All the above were most often bilateral but were at times unilateral

Sudden manifestations, usually toward the end of treatment.

Frequent convulsive seizures

Dramatic complications, suggesting that the whole central nervous system is thrown into a frenzy of disorganized activity

If the patient did not react in forty-five minutes, even when intravenous glucose had been given, trouble was to be expected. The pupils were small, slowly dilated and were associated with marked flushing of the face. These followed convulsions, labored breathing and complete exhaustion. There were alternate periods of activity and relaxation, at times continued for one or two hours, the attack diminishing in severity and duration at each occurrence.

The tremendous importance of insulin hypoglycemia treatment in relation to schizophrenia is brought out by Cameron and Hoskins, who point out that because of the chronicity of this disorder, schizophrenic patients occupy one fifth of all the hospital beds in the United States. The sponta-

neous remission rate is from 20 to 40 per cent, and this makes it difficult to interpret the results of any treatment.

Lemere treated 17 chronic cases of dementia praecox and obtained a remission in 23 per cent. He believes that the effect of insulin shock is nonspecific, and that any agent that produces a convulsant action on the cerebral cortex has the same result.

Himwich and Fazekas studied the effect of hypoglycemia upon the brain metabolism. The brain seems to be the only organ which acquires its energy exclusively from the oxidation of carbohydrate. Its respiratory quotient *in situ* is unity. Furthermore, it has but little store of carbohydrate. Even in diabetes the respiratory quotient of the brain remains unchanged, according to the experimental work of these men. They state that there is no evidence that fat enters into the respiratory metabolism of the brain, because acetone substances are neither poured into the blood stream during diabetes nor absorbed for oxidation from ketonemic blood traversing the brain. They studied the changes in the brain of 14 dogs anesthetized with Amytal. During hypoglycemia the utilization of glucose on the average was 12.5 per cent and that of oxygen 7.99 per cent. When the blood-sugar values were as low as 22 mg per cent, the utilization of glucose was less than of oxygen, showing that the small store of carbohydrate in the brain must have been utilized during this period of intense hypoglycemia. They considered it probable that the central nervous system ceased to function only when no further carbohydrate, either in the blood or in the brain, was available.

According to Page, whose new monograph reviews the entire present knowledge of the chemistry of the brain, brain tissue does not lose the power of converting glucose to lactic acid in diabetes, but little of the lactic acid produced is formed from glycogen, most of it being formed directly from blood sugar.

Electroencephalographic records during thirty-five insulin treatments of 6 schizophrenic patients are reported by Hoagland and his associates. After large doses of insulin the brain waves show a progressive decline of the alpha wave (Berger rhythm) of some 40 per cent, which parallels the declining blood-sugar curve. Sugar injections during the hypoglycemia restore the frequency. The present view is that alpha frequencies are directly proportional to the rate of carbohydrate metabolism of the cortical cells producing the rhythm.

Resistance to insulin was early noted by Sakel in certain cases of schizophrenia when insulin was given for hypoglycemia treatment. Varela-Fuentes and Rawak described 1 patient who received 160

units and another who received 350 units intravenously without much effect. Intravenously they gave as much as 360 units. They considered the possibility that in certain cases of this disease there exists on the part of the adrenal medulla an extraordinary capacity for reacting which permits an outpouring of adrenine which counteracts the insulin.

Quigley studied the effects of atropine or novatropine following the production of hypoglycemia with insulin in 6 normal medical students. He found that the hypoglycemic symptoms were effectively counteracted by moderate doses. However, after twenty-five or more minutes, in 50 per cent of the experiments, pronounced mental disturbances, chiefly amnesia and speech disturbances of varying intensity, developed, presumably because of a synergistic action of insulin with the other drugs used. The author warns against the use of atropine preparations in a patient with hypoglycemia unless due regard is given to the mechanism by which the hypoglycemia is produced.

Scott estimated the blood sugar following encephalography on 75 patients because of the reported observation that following the taking of encephalograms the blood sugar rises. The highest values obtained in his series averaged 152 mg. The maximum value was 234 mg. and the lowest 100 mg. The high values in most cases occurred in epilepsy and the low values were in cases of tumor of the brain. The author directs attention to a report by Reese in a case in which diabetic coma developed after encephalography, and the patient died.

Kraus and Chaney describe a man of thirty-six who was given antitetanic serum and developed pain, nausea, vomiting and finally atrophy of the muscles about the shoulder. Other patients in their series showed paralysis or disturbance of sensation, particularly of the hands or arms, but all recovered.

These symptoms of serum disease of the nervous system may possibly explain an unusual case in our experience. In Case 7150 the patient developed symptoms some few weeks after he began to use protamine insulin, these consisted of transitory weakness of one arm, then a weakness of the right foot with various reflex changes which were quite characteristic of multiple sclerosis. At the end of eighteen months the symptoms are now somewhat improved. Whether time will prove that this is a case of true multiple sclerosis rather than serum disease of the nervous system, we cannot tell.

COMPLICATIONS

Pregnancy Since the introduction of insulin the number of diabetics who become pregnant has increased largely owing to the prolongation of the

lives of juvenile diabetics and the increased fertility of adult diabetics. Hurwitz and Irving report that, since 1916, 51 diabetics were delivered at the Boston Lying-in Hospital without death from diabetes. They discuss the fetal mortality given by previous writers, varying in the region of 45 per cent. The mortality at this hospital between 1916 and 1932 was 43 per cent, if, however, it were corrected to consider only those infants alive in utero at the first examination, the rate would be only 25 per cent. In 1932, 18 diabetic pregnancies had a gross fetal mortality of 17 per cent, though again, if correction is made, the rate is only 11 per cent. The high rate is due to acidosis, excessive size of the fetus and increased frequency of fetal anomaly. Hurwitz and Irving conclude that under proper management the diabetic mother may be expected to go through pregnancy and labor successfully. Cesarean section is reserved for cases in which the infants exceed normal weight or there are obstetric indications. They hold that insufficient stress is laid upon the peculiar types of toxemias seen in diabetic mothers, and particularly on the danger of pregnancy to young diabetic women whose diabetes began in childhood and is of long duration.

Tuberculosis Our further experience with tuberculosis and diabetes is giving us a more hopeful attitude. Thus, in the follow-up of our acidosis cases at the Deaconess Hospital, a much lower rate of development of pulmonary tuberculosis is being encountered than formerly. The much improved prognosis in acute cases is well illustrated by the case reported by Shepardson and Noble, the patient was a registered nurse of thirty-four, with diabetes of five years' duration, who was taking insulin. Four years after the onset of diabetes she had diabetic coma, which required 175 units of insulin in twenty-four hours. Her acute illness with fever and night sweats and cough did not begin until a year after this coma, and she then had tuberculous pneumonia, the sputum showing many tubercle bacilli. There were two cavities. Artificial pneumothorax was used, with excellent results. During the next two years she gradually improved and since July, 1935, she had been carrying on her duties as a nurse.

Bertram, discussing his 80 cases of tuberculosis in diabetics again denies that he has ever had hemorrhages of the lung as a result of insulin injections. He believes that Kaiser's cases were given diets too low in carbohydrate, and that this may have been the cause of the bleeding, although he admits that possibly adrenalin could have been responsible. He urges high-carbohydrate diets.

One must still recognize the danger of tuber-

culosis in diabetic patients, particularly in the young. Dunlop emphasized this danger especially in children who have had coma. Interesting experiments on the development of tuberculosis were carried out by Schedtler on animals whose thyroid glands had been removed or which had been given thyroxin. The fact that tuberculosis seems to progress rapidly in the presence of myxedema is often commented upon. This is of interest in relation to the possibility that fat metabolism and particularly the cholesterol in the blood are factors in resistance to tuberculosis. This relation is clearly shown in diabetic patients who have had acidosis and lipemia.

Vascular Disease Cardiovascular disease, together with peripheral vascular disease, continues to be a major problem in the treatment of diabetes. Radnai and Weisz studied 400 cases and made electrocardiographic examinations of 260 of them. Forty per cent of the latter cases showed changes. Cardiac decompensation was discovered in 20 per cent and angina pectoris in 10 per cent. The frequency of cardiac decompensation of the congestive type is rather striking in this series. In general, at the Deaconess Hospital we have found that congestive failure occurs rather less frequently than in a general cardiac clinic.

Edelen emphasizes what we have so long practiced at the Deaconess Hospital, namely the avoidance of heat in the treatment of impaired circulation of the feet. The danger of increasing the tissue metabolism above the level where the blood supply is capable of providing sufficient circulation, and thereby hastening gangrene, is a real one. By all means continually repeat the warning to the patient: Do not have a hot-water bottle, hot stones, or any source of heat in bed with you.

Scupham and de Takats give an excellent review of the recent literature on peripheral vascular disease. De Takats comments especially on the methods of arteriectomy recommended by Leriche for cases with completely obliterated arteries. Leriche has emphasized that an obliterated artery ceases to function as a carrier of blood and becomes a diseased plexus of the sympathetic nerve fibers which maintain vascular spasm, he therefore advocates removing this section of the artery. De Takats, while granting that this is an important principle and deserves consideration, points out that the results of arteriectomy are not encouraging.

Dermatology Sugg and Stetson describe a young man of twenty-seven, exceptionally obese, who developed lesions of xanthoma tuberosum on the elbows and knees at points where his occupation as a tile setter had traumatized the skin. His dia-

betes was extremely mild, the blood cholesterol was only 170 mg. Two nodules were removed for biopsy, they showed foamy cells, and a diagnosis of fibroxanthoma was made.

Surgery Atnan and Fenz studied the blood sugar before, during and after various types of anesthesia in nondiabetic and diabetic patients. They found that with Evipan given intravenously the blood sugar rose only slightly, even in the diabetic patient with spinal anesthesia the increase was much less than with ether anesthesia but lasted longer. The authors conclude, however, that spinal anesthesia is not contraindicated in diabetes mellitus.

Continued improvement in the results of surgical treatment are reported where good medical and surgical teamwork is brought about. Williams and O'Kane report a five-year study of 496 cases. The mortality in cases with lower-extremity lesions, operated and unoperated, fell from 48 to 19 per cent.

Because of the distribution of surgical diabetics in the older age groups with impaired circulation, we have given further attention to the problem of pulmonary embolism following Barnes's excellent review from the Mayo Clinic. Our regime has already included, among other things, the rubbing of backs and turning of patients every two hours day and night and the use of the Balkan frame and other measures for exercising the upper extremities of all patients constantly in bed. We now insist that all elderly patients in bed flex and extend the legs and exercise the feet once an hour, and take several deep breaths or cough once an hour in order to promote venous return from the extremities. Finally, we have redoubled our efforts in this group to prevent abdominal distention as a definite factor in causing venous stasis in the pelvis and lower extremities.

Trauma During 1937 appeared the volume *Trauma and Disease* edited by Brahdy and Kahn (Lea & Febiger), Chapter XV is devoted to "Trauma and Diabetes." In this chapter Joslin, Root and Marble have assembled the literature, mostly German, upon the subject and have added their own material. The forty-five page article is too long for review, but so few publications upon the subject have appeared in English that attention is called to it. An abstract of the article appears in Joslin's *Treatment of Diabetes* (Lea & Febiger, 1937).

In Germany, Umber has written extensively upon trauma and diabetes. In an address in Berlin he restated his earlier view: "Traumatic glycosurias occur, but there is no traumatic diabetes." In legal

studies, the most frequent errors come from the use of material which was published before the discovery of insulin. In those early days it was difficult to distinguish between glycosuria and diabetes. The classical type of the former is the glycosuria resulting from the Claude Bernard puncture.

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ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24221

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The temperature was 101°F, the pulse 110. The respirations were 25.

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DR. HENRY D. STEBBINS. Could not a rupture of one of the cusps of the aortic valve explain the picture?

DR CABOT Do you think he had coronary embolus?

DR WHITE Neither rupture of a valve nor coronary embolism was seriously considered. Our attention was focused more on the cough, the blood-spitting and the cyanosis. We should have thought, however, of valve rupture.

DR CABOT Did you think he had infarction in the lung?

DR WHITE Yes

CLINICAL DIAGNOSES

Subacute bacterial endocarditis

Rheumatic heart disease with aortic and mitral insufficiency

DR CABOT'S DIAGNOSIS

Subacute bacterial endocarditis, aortic valve

ANATOMICAL DIAGNOSES

Endocarditis, subacute bacterial, aortic and mitral valves

Ruptured mycotic aneurysm of mitral valve.

Rheumatic heart disease, healed, aortic valve, with aortic insufficiency and left ventricular hypertrophy and dilatation

Pulmonary edema and congestion, acute

Hydrothorax, bilateral, marked

Hyperemia of liver and kidneys

Infarct of spleen

PATHOLOGICAL DISCUSSION

DR MALLORY The salient feature of this case seems to me to be the very sudden cardiac failure in a boy who had had bacterial endocarditis for an apparently short period of time and whose disease up to the morning of the terminal episode was progressing at a slow rate. I doubt if anyone a week before death would have expected a sudden event such as this. The actual findings at autopsy were quite unusual and come nearer to the suggestion of a rupture of one of the leaflets of the aortic valve than anything else that was mentioned, although it was not that.

In a great many cases of bacterial endocarditis involving the aortic valve the vegetations spread down onto the base of the cusps and extend onto the long leaflet of the mitral valve, where they develop on its ventricular surface. Sometimes they penetrate directly through the valve and you get sudden marked mitral insufficiency. In this case the ulceration must have been progressive for a considerable period of time before clinical symptoms appeared because there had been time to pro-

duce an aneurysm between the two surfaces of the mitral cusp, essentially a mycotic aneurysm. This was nearly 3 cm in diameter. At its apex we found a relatively small perforation which I think was probably a terminal event. I should imagine that



Figure 1

in this case the mycotic aneurysm of the valve had been developing for a long time. It then ruptured, and the sudden mitral insufficiency accounted for the rapid onset of failure. The finding of marked bilateral pleural effusions and an extreme grade of acute pulmonary congestion and edema seem to substantiate this hypothesis.

Figure 1 shows the ventricular surface of the mitral valve and the relatively wide area of ulceration of the base of the leaflet, which is really the mouth of the aneurysm. In Figure 2 the valve has been turned over to show its auricular surface, and the aneurysmal sac is evident with a slit-like perforation near the right-hand margin. The sac was very thin walled and consequently has collapsed almost completely, but in life, when it was distended with blood, it must have nearly filled the valve ring and one would suppose it must have produced a marked grade of stenosis.

DR SPRAGUE Was there any rheumatic involvement of the mitral valve?

DR MALLORY We thought there was a little, but it was hard to be sure of. Old rheumatic involvement of the aortic valve was obvious, however. I should add that there was comparatively

little evidence of embolism. There were no emboli in the lungs, and the coronaries were clear. One large infarct was present in the spleen and must

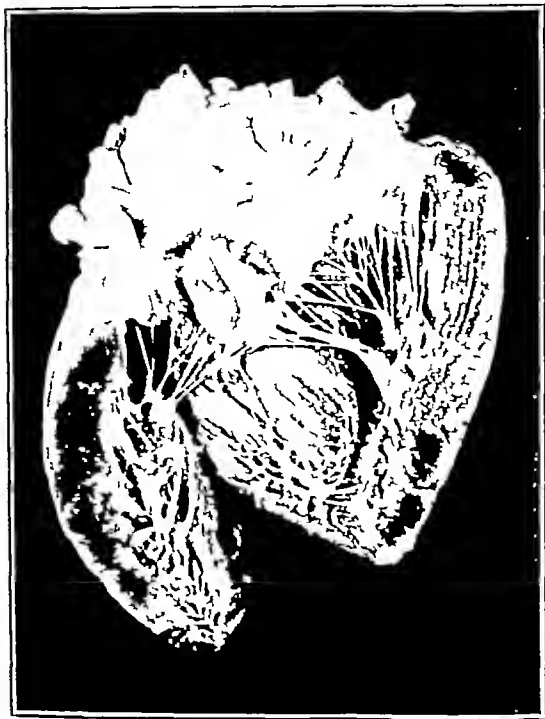


Figure 2.

have been the cause of the attack of abdominal pain. Even the kidneys failed to show the usual embolic glomerulitis.

CASE 24222

PRESENTATION OF CASE

A twenty-one-year-old, white, American woman entered the hospital with the complaints of weakness, nausea, vomiting and epistaxis of seven days' duration.

The patient stated that she had been born with heart trouble and had always lived a restricted life. She was always mildly dyspneic on climbing a flight of stairs and never had been able to take part in athletics. Aside from this she had no other symptoms and had finished high school at the age of nineteen. About fourteen months before entry she began to have pains in the calf muscles, and red macular lesions appeared on her legs which usually lasted a few weeks and then disappeared only to recur later. She was also much weaker than she had been before, tired more easily, and consequently spent most of the time in bed. She remained in bed for practically the entire year before entry. Ten months before entry her urine became dark amber colored, and her physician told her

that she had kidney trouble. At no time did she have frequency, dysuria, nocturia or frank hematuria. During the period from eight to five months before entry she had had three attacks of pleuritic pain in the left lower lateral chest, which lasted from ten to fifteen days and were somewhat relieved by strapping. Seven months before entry she had had some pitting edema of the ankles which disappeared on complete bed rest; there was no edema around the eyes. For the two months before entry she had an unproductive cough. Seven days before entry she had severe epistaxis from her left nostril, losing "well over a quart of blood." This occurred at the time when she expected a menstrual period, and the period itself did not occur. She said that for seven years she had always had mild epistaxis during her menstrual periods. For the seven days before entry she was unable to retain food by mouth because she vomited everything eaten. She was given repeated rectal taps but steadily lost ground. She was very nervous, weak, dyspneic and orthopneic, and had definite fever. For two or three weeks before entry she noticed small, painful red spots at the tips of her fingers and toes.

One of her sisters was known to have congenital heart disease.

Physical examination revealed a very pale, fairly well-developed but undernourished woman, who appeared to be acutely and chronically ill. There were small, round purpuric spots on the dorsa of the feet, and the fingers were slightly clubbed. The heart was very slightly enlarged to the left, and in the pulmonic area, systolic and diastolic thrills and murmurs could be made out. The pulmonic heart sounds were both very loud. A systolic murmur was heard at the apex. The heart rhythm was regular, and the blood pressure was 90 systolic, 30 diastolic, in both arms. The lungs were negative. The abdomen was held tense, but both the liver and spleen could be felt three fingers below the costal margin. There was slight dilatation of the neck veins, but no peripheral edema.

The temperature was 100.5°F, the pulse 125. The respirations were 25.

The urine had a specific gravity of 1.020, contained a large trace of albumin, and the sediment showed 20 red cells, many white cells and a few casts per high-power field. The blood showed a red-cell count of 3,040,000 with 40 per cent hemoglobin, and a white-cell count of 23,600 with 92 per cent polymorphonuclears. The blood Hinton was negative. The corrected sedimentation rate was 0.6 mm per minute. An electrocardiogram showed moderate left-axis deviation and low voltage. A portable x-ray of the chest showed enlarge-

ment of the heart on both sides, and haziness in the right lower lung field

On the third hospital day there were diminished breath sounds and dullness in the lower third of the right lung and slight pitting edema of the ankles. Her skin was cold, clammy and cyanotic, and she had Cheyne-Stokes breathing. She was put into an oxygen tent without much benefit and died that evening.

DIFFERENTIAL DIAGNOSIS

DR. HOWARD B. SPRAGUE: When a patient states that she was born with heart disease the observation may or may not be correct. In the main it is correct because, at an early age, congenital heart disease is to be expected and rheumatic heart disease is very rare under the age of five. We can assume that this patient had been observed constantly from birth, furthermore, she had one sister with congenital heart disease. I think it is fair to assume then that we are dealing with a congenital deformity of the heart and not an early rheumatic lesion. That is supported by the physical findings which show, most particularly, systolic and diastolic thrills and murmurs over the pulmonary area. Systolic and diastolic murmurs may well be called a continuous murmur, and a continuous murmur in that area implies a diagnosis of patent ductus arteriosus. Pulmonary stenosis with pulmonary regurgitation is extremely rare. We have seen only one such case in association with a congenital absence of the pulmonary valves with a very small pulmonary artery, and in that case the diastolic murmur was slight and there was no thrill with it.

There are two main types of patent ductus arteriosus so far as hemodynamics are concerned. The commoner type is that without cyanosis in which the flow is from the aorta into the pulmonary artery and in which, therefore, the arterial blood mixes with the blood of the pulmonary artery and cyanosis does not occur except as a terminal phenomenon when something comes up to raise the blood pressure in the pulmonary circulation, thus producing a flow in the opposite direction. This patient showed cyanosis only as a terminal affair. The other type is that found with a persistence of the fetal blood channels, that is, a flow from the pulmonary artery to the aorta, whereby non-oxygenated blood is shunted past the lungs into the aorta and systemic circulation. There was a mild degree of clubbing of the fingers in this case, which would perhaps help in the diagnosis of congenital heart disease, or perhaps would be related to the infection which we will take up later. The blood pressure finding of 90 systolic, 30 diastolic, is consistent

with patent ductus arteriosus because this condition causes the peripheral signs of aortic regurgitation due to a rapid passage of a portion of the blood from the aorta into the pulmonary artery, thus causing a rapid drop in the diastolic level.

An electrocardiogram showed moderate left-axis deviation. Patent ductus arteriosus puts a strain on both sides of the heart because the right ventricle has to pump against an increased pressure in the pulmonary artery. The left ventricle also has added work because the blood which passes from the aorta directly back to the lungs through the pulmonary artery returns at once to the left heart and has to be re-pumped into the peripheral circulation. This double strain is commonly found in the non-cyanotic type of patent ductus. We might get some help in diagnosis if we found, by x-ray, dilatation of the pulmonary artery from the increase in the pressure.

DR. GEORGE W. HOLMES: I assume that, since the lung fields are dense on both sides, this is a portable film taken when the patient was quite ill. The supracardiac shadow is unusually wide. It is magnified by the portable film but still I think there is no doubt that it is wide.

DR. SPRAGUE: It would support the idea that the pulmonary artery is dilated?

DR. HOLMES: Yes, it certainly would.

DR. SPRAGUE: Something else has occurred in the course of this patient's history to bring on the fatal termination. Infection has apparently arisen. It has resulted in fever, in petechial spots, in what I assume to be pulmonary emboli, and in a certain amount of bleeding from the kidney, probably from miliary emboli. If we are right in assuming that a subacute bacterial endocarditis has been added to the picture, then it would be consistent with our assumption that she had pulmonary infarcts, because, if blood is flowing from the aorta to the pulmonary artery, vegetations which break off would get into the lesser circuit. Such an occurrence has been observed on several occasions in this hospital, so that I believe this is the rather common combination of subacute bacterial endocarditis grafted on a congenital lesion, although it is really an endarteritis rather than an endocarditis or valvitis. The heart itself in the region of the apex has a systolic murmur, of which I can make nothing diagnostic so far as valvular disease is concerned.

DR. TRACY B. MALLORY: I take it you are assuming that the bacterial vegetations are at the actual site of the ductus arteriosus.

DR. SPRAGUE: I should think that they might involve the orifice of the ductus, perhaps on the pulmonary side.

CLINICAL DIAGNOSES

Congenital heart disease with acute or subacute bacterial endocarditis
 Patent ductus arteriosus?
 Chronic nephritis

DR SPRAGUE'S DIAGNOSES

Congenital heart disease
 Patent ductus arteriosus
 Subacute bacterial endarteritis of the patent ductus, with infarcts in the lungs and kidneys

ANATOMICAL DIAGNOSES

Congenital heart disease—patent ductus arteriosus
 Subacute bacterial endocarditis, aortic and mitral valves
 Bacterial endarteritis, pulmonary artery
 Infarcts of lung, spleen and kidneys
 Embolic glomerulonephritis

PATHOLOGICAL DISCUSSION

DR. MALLORY I asked Dr Sprague that last question for the purpose of emphasizing a point which seems to me very interesting. His answer was the natural one and his prediction would usually be correct, but it was not in this case, however. There was a patent ductus, of course—an extremely short one, however. The aorta and the pulmonary artery were in actual apposition and a small round hole led from one to the other. It was impossible to recognize any vessel. The mouths of

the hole on both sides—aorta and pulmonary artery—were free from vegetations. There was a bacterial endocarditis, however, which was on the aortic and mitral valves, and there was another similar vegetation in the pulmonary artery. This lay proximal to the orifice of the ductus and was clearly separated from it by a distance of 2 or 3 mm.

The relation of bacterial endarteritis to congenital heart itself has always been a very mysterious one. Next to rheumatic heart disease it is the most predisposing factor. Ordinarily, bacterial endocarditis *in these cases develops on the deformed valve*, if there is one, or at the site of abnormal connections between the various chambers of the heart, such as a congenital septal defect or a patent ductus arteriosus. Here we have a case with no evidence of deformity of any of the valves, but we have congenital heart disease and bacterial endocarditis combined, and the endocarditis is not at the site of congenital malformation.

A PHYSICIAN Where did it start?

DR. MALLORY I should rather suppose it started on the aortic valve and worked around from there. There was also a thrombus in the right auricle. However, this did not seem to be bacterial in origin.

A PHYSICIAN Were there any pulmonary emboli?

DR. MALLORY Yes, one or two that appeared to be frankly septic in character. There were emboli in the kidneys, which showed a well-marked embolic glomerulonephritis. There was an infarct of the spleen, which was not indicated by anything in the history.

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A MODEL STATE INSTITUTION

ENVY is a normal response of the human personality to certain situations, yet it is not considered a virtue but is looked askance upon by society. However one who has lived in Massachusetts during the last year and has been familiar with the humiliating, and to some extent, degrading, developments in the Department of Mental Diseases can properly be forgiven for being envious when reading the report *A Survey of Methods of Care, Treatment, and Training of the Feeble-minded at Letchworth Village* [New York State].

In summarizing the report, Dr. C-E A. Winslow, professor of public health at the Yale University School of Medicine, who served as chairman of the survey committee, says

The first quarter-century of Letchworth Village represents a notable chapter in the history of institutional care of the mental defective. A long succession of governors and legislatures have contributed to its support. An excellent State Department of Mental Hygiene has guided and assisted its development. A great executive, endowed with common sense, sympathy, and courage, built himself into its organization. A Board of Managers of unique vision and devotion—among whom the names of Franklin B. Kirkbride, its vital mainspring through all the years, and of Mrs. E. H. Harriman, who made the Research Department possible, must be mentioned with special gratitude—formulated its program and directed its policies. With the pursuance of that program and the continuance of such leadership the story of Letchworth's second quarter-century should be as significant as the first.

Massachusetts stands at the crossroads. One way leads to continued deterioration. This way involves the use of political patronage, the appointment of second-rate trustees, and a commissioner appointed solely on the grounds of political expediency. The other way calls for a revival of past ideals, a commissioner of great ability and energy chosen only on the grounds of previous achievement and ably and vigorously supported by the governor in his efforts, trustees chosen from the enlightened, socially minded leaders of the community who have no purpose in their trusteeships other than the elevation of the standards of the care of the insane, and individual hospitals with a professional staff which is free from annoyances by selfish politicians and whose members are leaders in their departments of medicine and in their communities, striving only to render a fine account of their stewardship to the people of Massachusetts.

THE ADVERTISEMENT SECTION

PROBABLY few of the readers of the *Journal* appreciate the importance of its advertising contracts to the Massachusetts Medical Society. All members of the Society know that the annual operating loss of the *Journal*—approximately twenty thousand dollars—is covered by an appropriation from society funds and that in consideration of this,

every member whose dues are fully paid becomes automatically a regular subscriber. Fifty-two copies are received each year at an approximate total cost of four dollars, or eight cents a copy.

Improvements in the *Journal* result in additional expense, and unless other sources of revenue are increased, the net result is an increase in the operating loss—a charge to the Society.

The largest source of revenue is from advertising contracts, during 1937 it amounted to more than twenty thousand dollars. The *Journal* has nothing to do with obtaining the majority of contracts, as they are forwarded by the Cooperative Medical Advertising Bureau, of Chicago, a subsidiary of the American Medical Association. This organization negotiates the contracts with firms which advertise nationally in state medical journals, and the only acceptable copy concerns drugs, therapeutic agents and foods which are acceptable to the respective approving committees of the American Medical Association.

Advertising revenue is bound to vary with general business conditions, but there is every indication that the cancellation of contracts that is threatening or has occurred during 1938 is due, in no small part, to lack of interest on the part of the readers in patronizing the advertisers in the *Journal*. Their purpose is not altruistic, but practical, and if there is no indication that their advertisements are being read, they cancel their contracts.

The *Journal* takes this opportunity of humbly requesting its subscribers to read more carefully the advertisement section. Although it is impossible to dress this up as attractively as is done by our plutocratic lay contemporaries, it should be remembered that the products advertised therein represent acceptable therapeutic aids as supplied by manufacturers of the highest ethical standing. Every inquiry to an advertiser makes the *Journal* a better advertising medium and indirectly results in its improvement through increased revenue.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. FLETCHER EADES, M.D., *Secretary*
19 Bay State Road
Boston

CASE HISTORY No. 74 BLEEDING DUE TO CERVICAL POLYP

Mrs. T. G., a thirty-four-year-old nullipara, was seen on January 20, 1938, complaining of painless vaginal bleeding. She came for examination to find out whether she was pregnant, her last regular period having started July 16, 1937, making her due for delivery the end of April.

The family history was of no value. Her mother and father had died in another country of unknown causes, three brothers and one sister were living and well. Previous medical and surgical history of the patient was negative except for pneumonia in 1931. Catamenia began at fourteen and was regular and of the twenty-eight-day cycle, lasting six days.

A detailed history of the painless vaginal bleeding is as follows. On July 16, 1937, the patient menstruated regularly. There was a period of amenorrhea until October 1, which the patient naturally considered as indicating pregnancy. From October 1 to November 25 there was intermittent spotting, some days fairly profuse and other days just noticeable. At no time was there any pain. From November 25 to January 8 the patient was symptom free except for questionable abdominal enlargement. On January 8 there was a slight flow for one day, and on January 15 flowing necessitated the wearing of a pad.

On examination the abdomen was enlarged to the size of a six-months' pregnancy. Definite fetal parts were palpated, and the fetal heart tones were heard. Pelvic examination revealed an enlarged and soft cervix, with a polyp the size of a large grape protruding from the os. The base of the polyp was very near the external os and easily visualized on speculum examination. Very slight trauma to the polyp caused immediate bleeding.

Considering the location of the polyp, the marked congestion which it showed and the feeling that it was the causative factor of the bleeding, removal seemed advisable. A Ferguson speculum was in-

A series of selected case histories by members of the section will be published weekly.

Comments and questions by subscribers are solicited and will be discussed by members of the section.

serted, the polyp was grasped with a sponge forceps, and the base deeply cauterized. After removal of the polyp there was very slight bleeding from the base, which was further cauterized to control the ooze.

The patient was advised to return home, remain quiet in bed for forty-eight hours, and report any bleeding or untoward symptoms. A report from the patient four weeks after removal of the polyp was completely negative.

On April 10 after a perfectly uneventful primiparous labor lasting eight hours, she was delivered by low forceps of a 7 lb., 14 oz., female child. Her convalescence was uneventful, and both mother and baby were discharged well.

Comment Cervical polyps as a complication of pregnancy are not uncommon. Naturally as the age of the patient advances the possibility of polypoid development increases, since polyps develop secondary to chronic cervicitis of rather long standing. Their diagnosis is made by a history of irregular bleeding, by vaginal examination,—the polyp being felt inside the cervix,—and lastly by inspection. The importance of an early pelvic check-up is shown in this case. If this patient had been seen earlier, the polyp could have been removed when not so congested and with a greater feeling of ease, since naturally the farther along in pregnancy a patient is, the more one wishes to avoid instrumentation of the genital tract, thereby minimizing the chances of infection. Removal and cauterization of the base should cause no trouble so far as the pregnancy is concerned. The possibility of inducing labor is very remote since deep cauterization of the canal is not done. Because of the constant flow and the possibility of hemorrhage during and after delivery, these vascular tumors should be removed during the early prenatal course.

EPILEPSY

John is a fifteen year-old schoolboy, healthy, happy, the pride of his parents and the mainstay of his neighborhood ball team. One day while sitting quietly in his seat at school, John makes a groaning noise, all his muscles become rigid, his breathing stops, his face turns blue, he falls heavily to the floor, his arms and legs jerk violently for a minute or so then thoroughly exhausted he sleeps, and wakes without any knowledge of what has happened. Instead of having a convulsion, perhaps he simply stops what he is doing, stares vacantly for a few seconds unconscious of his surroundings, then resumes his work as though nothing had happened. Or, what is least likely, John may suddenly begin to act as though confused or intoxicated. Though he appears to know what he is doing, he can not be guided or controlled. Then after some minutes he is himself again.

These are three different forms which epileptic seizures may take. An epileptic may have any one, or all these kinds of seizures. They may occur but once in a life time, or may recur at intervals of hours, days or years.

The New Testament contains a vivid word picture of a distracted father bringing to Jesus his son who was subject to convulsions. The disease, said the father, cast the son "into the fire and into the water" and even as he came he fell on the ground and wallowed foaming." Confronted with this medical problem, modern physicians are oftentimes as baffled as were the disciples of Jesus. For centuries both before and after the time of Christ the epileptic was believed to be possessed of a demon. Though we moderns may not believe this, in the fastidious society of the present a "fit" is still looked at with horror and the person who is subject to such attacks is oftentimes cut off from normal associations and employment.

The problem of epilepsy is of importance to the state as well as to the individual. In the United States there are more than 500,000 persons who are, or have been, subject to seizures. Of this number about 40,000 are housed in various state institutions, at a cost for maintenance alone of about \$18,000,000 a year. However, more than 90 per cent of patients are in the community, and if given a proper chance, the great majority of these would be able to live fairly normal lives.

What can be the cause of this terrible condition which like a wild animal leaps upon the innocent and unsuspecting person? Epilepsy would best be considered a symptom rather than a disease. As in the case of other symptoms, headache for example, the cause may differ for different persons or for the same person from time to time. Furthermore, the symptom may not be the result of a single cause but the sum total of several.

First, I shall mention the various causes of seizures. The first cause is heredity. This factor has been over-emphasized. Only about one fifth of patients with seizures know of a relative who was similarly affected. The inheritance of diabetes is as great as that of epilepsy. The 'susceptibility' is present in all who develop the condition, but whether seizures actually appear may depend on additional acquired causes.

Causes which are most likely to start epilepsy in a predisposed individual are injuries or infections of the brain, and the most serious time for such to occur is at birth or in infancy.

Epilepsy may also be stimulated by the failure of some organ in the body. For example, disease of the kidneys may result in the accumulation of poisons which irritate the brain and start convulsions. Then in some patients constipation, poor posture, a hidden infection, a weak heart or an emotional disturbance will precipitate an attack. In every case the seizure originates in the brain, but these other disorders may increase the irritability of nerves and set off an attack. From the aspect of treatment, removal of such last straws may save the camel's back.

How can the cause or causes of seizures in a given individual be determined? Because the causes are different in each person, every person with seizures should have careful physical and laboratory examinations. By no other means can abnormalities either of the brain or of the body be detected. Recently, a most important instrument called the electroencephalograph which makes a record of the electrical currents in the brain has been perfected.

What is the treatment of epilepsy? First, efforts should be spent in correcting any cause discovered by the physician in his examinations. The second line of treatment is to increase the patient's resistance to attacks by the maintenance of robust physical and mental health. The diet

A Green Lights to Health broadcast given by Dr. William G. Lennox on Wednesday, May 18, and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

should be varied and should include meat. In the case of children, striking benefit has often been secured through the use of the so-called ketogenic diet—a diet that is rich in fats and poor in starches.

Drugs are not curative but are useful as sedatives to lessen the number or severity of convulsions. Of course drugs as well as other treatment should be at the direction of the physician, otherwise more harm than good may result. Patent medicines, the advertisements of which fill the mailboxes of patients, contain no new or unknown medicines. They are merely one or the other of two well-known drugs, given in unknown doses at exorbitant prices.

Contrary to popular opinion, weakening of the mind does not necessarily or even usually occur. There is need for the education of the family and the public to the attitude that recurring seizures are not dreadful things but are only, like sick headaches, temporarily incapacitating. So far as feasible the patient himself should go ahead in spite of epilepsy. Millions have done this. Many persons of eminence have been epileptic: witness Mohammed, Julius Caesar, Lord Byron, Swedenborg, Napoleon Bonaparte, and many others.

In ending, let me emphasize that epilepsy is more a symptom than a disease. The causes vary in different persons. The finding and the treatment of the causes require careful examinations and long-continued treatment at the hands of a doctor who is both interested and informed. There is great need of a changed attitude on the part of the public toward seizures and toward epileptics. New methods of treatment have recently been found, but there is crying need for more adequate support of research in this disease.

Q My child had a convulsion when he was teething. What chance is there that he will have convulsions later in life?

A According to one investigator, the chances are five times greater than if he had not had any such trouble, in other words his chances of getting epilepsy are about one in forty instead of one in two hundred.

Q What is the difference between luminal and phenobarbital?

A They are the same. Luminal is the name used by a certain manufacturing firm and costs more than phenobarbital.

Q Is there no hope of finding a medicine better than phenobarbital?

A Yes, of course. In fact studies now underway give encouragement in this direction.

Q A friend of mine has a boy about twelve years old who is having very bad convulsions, his mother is very nervous about keeping him at home. Is there any place where such a child can be sent? They do not have much money.

A Eleven of the states including Massachusetts maintain colonies for epileptics where care is given without charge. As you may suppose, practically all the patients in these colonies are physically and mentally far below normal, and there is the question whether a mentally normal child should be sent to them.

Q But this child is quite bright and most of the time is very lovable. The parents do not want to put him away in a big institution. Is there no private place where he can be taken care of inexpensively?

A Unfortunately in spite of the obvious need there seems to be a lack of small adequately staffed and yet in

expensive hospitals for the care and treatment of early cases.

Q If this is such an important sickness why do the doctors not get busy and find out the cause and cure?

A Some doctors are busy. Research work is being carried on in several centers, Boston being a principal one. The Harvard Epilepsy Commission is organized for the purpose of collecting funds to be used in this research.

Q A friend of mine writes me that she is frantic because her child has started having convulsions. She has consulted about all the doctors in her town, but they say they know little about this and just say wait and see if the child will outgrow it. You said that much new knowledge had been gained recently. What I want to ask is this: Are the doctors who know most about this disease explaining what they know to the doctors who know little about it? And also: Is there any place to which a person could write, or is there any printed material that they could get, which would explain about the disease and special treatments that might be tried?

A That is a large double-barreled question. The doctors have indeed formed a society called the League Against Epilepsy for gaining and scattering information. Also there is the Epilepsy Commission of Harvard University to which your friend might write.

Q You spoke about the need of funds. Why would not the prevention and cure of epilepsy be as good a way to employ government funds as finding a cure of hog cholera or building little used roads?

A Why not?

Q You spoke of the necessity of consulting a doctor. How do you explain the following? A neighbor of mine went to many doctors without help, then sent off for a patent medicine and has not had a spell since. Another neighbor had the same experience after going to an osteopath.

A There is great variability in the frequency of seizures. Patients even without any treatment may have long periods, sometimes years in length, without an attack. As for the patent medicine, I have explained that these contain the drug usually prescribed by doctors, but the patient may have taken it in much larger doses than the doctor would consider safe. Excessive doses of these sedatives can make the cure worse than the disease.

Q Would you advise marriage as a means of stopping attacks?

A No. The idea that marriage is a cure is inherited from the Middle Ages.

Q Then does marriage make attacks worse?

A Again no, unless marriage brings added burdens and worries or undermines general health.

Q I still am not clear as to your position about marriage. Do you or do you not forbid a person with epilepsy to marry?

A I do not forbid them. I give the available statistics and explain the pros and cons, and let the patient decide—as he would decide without my advice.

Q Children who begin to have epilepsy should, I suppose, be taken out of school.

A No. They should maintain such mental activity as is consistent with normal exercise, recreation and sleep.

Q But how about the harm to other children which would come from seeing a convulsion? Would you want your own child in the same classroom with an epileptic?

A Of course there is a limit as regards the number and severity of attacks which can be tolerated in a classroom. However, I personally believe that a good many of the nervous ills of adults are due to overprotection in childhood. We cannot be shielded or run away from unpleasant sights all our lives. Early acquisition of a matter-of-fact attitude toward seizures is advantageous. I want my children to associate with and have a sympathetic attitude toward children who are making a brave fight against some physical handicap, and I should object to a beginning or mild case of epilepsy being taken out of school on their account.

Q I know a young woman who has the light, petulant spells which you described. A man wants to marry her, but does not know of her attacks. Ought she to tell him?

A By all means. Aside from the question of fairness, keeping him in ignorance would be legal grounds for divorce in some states.

DEATHS

DEZELL—FREDERICK BURR DEZELL, M.D., of Lynn, died February 2. He was in his seventy-first year.

Born in New York, he received his medical degree from the Johns Hopkins University School of Medicine and then settled in Lynn.

Dr. Dezell was a fellow of the Massachusetts Medical Society and the American Medical Association.

His widow, a son and daughter survive him.

LASKEY—EDWARD P. LASKEY, M.D., of 48 Highland Avenue, Haverhill, died April 23. He was in his fifty-sixth year.

Born at Dover, New Hampshire, he attended the public schools there, later graduating from Dartmouth College and receiving his degree in 1908 from the Harvard Medical School. For a year after he left Dartmouth, Dr. Laskey taught at the Weyland High School, serving as sub-master.

After serving a two-year internship at the Boston City Hospital, he started a general practice in Haverhill. Dr. Laskey was a specialist in the use of radium and was one of the first doctors in the vicinity of Haverhill to acquire equipment and use radium extensively. In 1915 he sailed with the Harvard unit, to Falmouth, England, for service in an English field hospital. A former member of the Gale Hospital, he was a consultant on the staff of the Hale Hospital at the time of his death. For many years he served as school physician.

Dr. Laskey was a fellow of the American Medical Association and the Massachusetts Medical Society. He also was a member of the Pentucket Medical Association and the Haverhill Medical Club.

His widow, a son, daughter, brother and sister survive him.

MISCELLANY

COURSE FOR MEDICAL SECRETARIES

Realizing that a doctor needs a secretary with qualifications quite different from those of the ordinary business secretary, Boston University's college of practical arts and letters, in conjunction with the school of medicine, is completing the first year of the new medical secretarial course which was started last fall. The first group of students will graduate a year from this June.

Miss Elizabeth W. Carvell, assistant professor of secretarial studies, supervises the office training, and Dr. Helmuth Ulrich, associate professor of clinical pathology, is chief counselor in medicine. The aim of the course is to make it so practical that when a girl completes her work she can step into a doctor's office and carry on the secretarial work competently without the usual eight months or a year that doctors now have to spend in training a girl for their specialized work.

"A doctor's secretary must be different from any other type of secretary," said Miss Carvell. "Dealing successfully with sick people takes an entirely different psychological outlook than that needed by a girl who works in a lawyer's office or in a bank. Unless a doctor can afford both a nurse and a secretary, his assistant must be able to care for his supplies, to perform first aid, to make blood tests and analyses, all in addition to her general duties of caring for correspondence and bookkeeping."

NOTES

Dr. Harvey Cushing, Moseley Professor of Surgery (emeritus), Harvard University, and Sterling Professor of Neurology (emeritus), Yale University, has been made an honorary member of the Biological Society of Vienna.

Dr. Walter B. Cannon, George Higginson Professor of Physiology, Harvard University, recently delivered the William H. Welch lectures at Mount Sinai Hospital, New York City. The titles were "Some New Aspects of Homeostasis" and "The Aging of Homeostatic Mechanisms."

A grant for an indefinite period of time by the permanent Science Fund of the American Academy of Arts and Sciences has been made to Dr. William C. Boyd of the Boston University School of Medicine. It will enable Dr. Boyd to continue his research in blood groupings, which chiefly concerns a determination of the relations existing between peoples living now and those living in the earliest known period of history.

CORRESPONDENCE

ALEXANDER POPE'S PHYSICAL DISABILITIES

To the Editor: The fact that great physical disability and suffering have never been a bar to distinguished literary achievement is so well known as to require little comment. We have but to think of the Brontës, Heine, Parkman and the great Russian surgeon, Pirogoff, among numerous others.

The following quotation concerning Alexander Pope is interesting in this connection. It is from a volume entitled *From Anne to Victoria: Essays By various hands* (edited by Bonamy Dobree, Cassell & Company, 1937), and is quoted from an "Essay on Pope," by W. H. Auden.

If Pope's social advantages were few his physical charms were even less. Only four feet six in height he was already a sufferer from Pott's disease, the "little Alexander whom the women laugh at," and in middle age was to become really repulsive. So weak as to stand in need of perpetual attendance, extremely sensitive to cold, so that he wore a kind of fur doublet under a shirt of a very coarse warm linen with fine sleeves. When he rose he was invested in a bodice made of very thick stuff canvas, being scarcely able to hold himself erect till they were laced, and he then put on a flannel waistcoat. One side was contracted, his legs were so slender that he enlarged their bulk with three pairs of

stockings, which were drawn on and off by the maid for he was not able to dress or undress himself, and neither went to bed or rose without help. His weakness made it very difficult to be clean. His hair had fallen most all away.

WILLIAM PEARCE COUES, M.D.

12 Monmouth Court,
Brookline, Massachusetts.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

To the Editor In addition to the articles enumerated in our letter of March 31 the following have been accepted

Calco Chemical Co., Inc.

Mandelic Acid—Calco

Cheplin Biological Laboratories

Cheplin's Epinephrine Hydrochloride Solution, 1 1000,
10 cc.

Cheplin's Epinephrine Hydrochloride Solution, 1 1000,
30 cc.

Lederle Laboratories

Viosterol (A.R.P.I. Process) in Oil

Eli Lilly & Co

Ampules Metycaine 10 per cent for spinal anesthesia

Ampules Metycaine 20 per cent for infiltration and regional anesthesia

Wm. S. Merrell Co

Ampules Solution Dextrose 50 per cent, 100 cc.

Parke, Davis & Co

Cevitamic Acid—P. D. & Co.

Tablets Cevitamic Acid—P. D. & Co., 25 mg

Schieffelin & Co

Sulfanilamide Tablets—Schieffelin, 5 gr

S.M.A. Corporation

3 Pyridine Carboxylic Acid (Nicotinic Acid)—
SMACO

3 Pyridine Carboxylic Amide (Nicotinic Acid Amide)—
SMACO

The following product has been accepted for inclusion in the List of Articles and Brands Accepted by the Council But Not Described in N.N.R. (New and Nonofficial Remedies, 1938, p. 508)

Armour & Co

Thyroid—Armour

PAUL NICHOLAS LEECH, *Secretary*

535 North Dearborn Street,
Chicago, Illinois.

REPORT OF MEETING

SUFFOLK DISTRICT MEDICAL SOCIETY AND BOSTON SURGICAL SOCIETY

A joint meeting of the Suffolk District Medical Society and the Boston Surgical Society was held April 20 at the Boston Medical Library

The meeting was opened by Dr Conrad Wesselhoeft.

Following a brief presentation of medical society business, Dr Wesselhoeft turned the meeting over to Dr William C. Quinby. Dr Quinby then introduced Dr Augustus Thorndike, Jr., who presented a paper on 'Trauma Incident to Sports and Recreation. Diagnosis and treatment.'

Dr Thorndike pointed out the increasing importance of trauma in competitive athletic sports during recent years, in which time participation in both organized and unorganized sports has been steadily increasing. The most serious injuries in his experience are encountered not in football, as might be expected, but in skiing, baseball and polo. An even larger number of less serious injuries, chiefly sprains, strains and contusions, are encountered in these sports. A detailed knowledge of the lesions involved in these injuries is essential if they are to be given proper treatment.

The fundamental pathologic disturbance is similar in sprains, strains and contusions, the difference depending on the location and extent of the injury. First, there is a tearing of tissue, followed by hemorrhage, which in extent may far exceed the original tear. Subsequently, the hematoma is absorbed, and coincidentally, a fibroblastic proliferation begins the process of repair. In specialized tissues, such as tendons and ligaments, this fibroblastic repair constitutes a permanent weakening, which is the basis for the axiom: Once a sprain, always a sprain.

Contusions may be classified as superficial, joint or muscle contusions. In competitive sports, the most common muscle contusions are seen in the thigh and knee. The usual superficial contusions occur on the lower leg or forearm, and most of them are near enough to the integument to make cold applications feasible in causing local vasoconstriction and, hence, limitation of hemorrhage. Cold should be applied for at least an hour, followed by the application of a pressure bandage. In severe contusions, rest of the injured part is essential, combined with cold applications and pressure. Sponge rubber pressure dressings are very useful in injuries involving joints.

The second stage of the treatment of contusions consists in hastening the resorption process by heat and massage. This should not be undertaken until hemorrhage has stopped completely.

Deep-muscle contusions are occasionally complicated by myositis ossificans traumatica. If this occurs near the end of a long bone or in the region of a joint it may result in permanent impairment of function. It may be suspected by the continued failure of a deep contusion to respond to treatment. X-ray diagnosis is usually not possible until the fifteenth day. The condition usually disappears with continued heat treatment.

The treatment of sprains is based on the same principles as that of contusions, and consists, first, in limiting the hemorrhage as much as possible and, secondly, in facilitating resorption and repair. It is essential to ascertain accurately the pathologic anatomy in each case. By careful palpation it is possible to determine the ligaments involved in any sprain. In ankle sprains, the most common type of injury is a tear of the anterior tibiofibular ligament, injuries to the medial and lateral collateral ligaments are less common. A series of lantern slides were shown to illustrate the treatment of sprains, showing the marked limitation of swelling obtained by the immediate application of cold and pressure bandages. Areas of ecchymosis along the borders of sponge rubber dressings demonstrated the degree to which deep hemorrhage had been limited. The duration of disability depends largely

upon the amount of hemorrhage immediately following a sprain

It was pointed out that strapping an acute sprain with adhesive plaster is a mistaken form of treatment. Strapping should be reserved for the later stages when the swelling has subsided, and is chiefly useful in preventing recurrent sprains. In competitive sports at Harvard, any players who have a history of sprain at any time within several years are strapped each day before entering contact work.

The types of strains were discussed briefly, with lantern slides to illustrate the lesions and their treatment.

The incidence of the more serious injuries, such as fractures, dislocations and internal injuries, is comparatively low in organized sports. The fractures received in football have been less serious than those in baseball and polo. In the unorganized sports, particularly skiing, there is a high incidence of severe injuries. Furthermore, in these sports there are fewer facilities for prompt first aid or medical attention.

Dr Thorndike's paper was discussed by Dr B. A. Godwin, who said that the prompt treatment which had been emphasized was rarely possible in industrial and street injuries. He agreed that the early control of internal hemorrhage determined the length of disability. Dr Henry H. Faxon cited the prevalence of athletic injuries in the younger age groups, which are lacking in full physical growth and development. He suggested that too heavy protective equipment might contribute to some of these injuries. He also called attention to the simultaneous use of a pressure bandage and cold applications in the early treatment of sprains. Dr Charles C. Lund discussed the occurrence of injuries in skiing, which he thought were somewhat exaggerated. He mentioned the need for more adequate first-aid facilities in ski areas. Dr Thorndike recommended the training of lay people for proper first aid work in the unorganized sports.

NOTICES

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve-thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen, discussed, and when indicated, treated with radium and high voltage x-ray.

Physicians are welcome to visit this clinic and bring patients to the clinic for diagnosis.

AMERICAN CONGRESS OF PHYSICAL THERAPY

The seventeenth annual scientific and clinical session of the American Congress of Physical Therapy will be held co-operatively with the twenty-second annual convention of the American Occupational Therapy Association, September 12, 13, 14 and 15, at the Palmer House, Chicago. Preceding these sessions, the congress will conduct an intensive instruction seminar in physical therapy for physicians and technicians—September 7, 8, 9 and 10.

The convention proper will have numerous special program features, a variety of papers and addresses, clinical conferences, round table talks, and extensive scientific and technical exhibits.

Information concerning the convention and the instruction seminar can be obtained by addressing The American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGIN MONDAY, JUNE 6

TUESDAY JUNE 7

*10 a m 12 30 p m Tumor clinic. Boston Dispensary
12 m Massachusetts General Hospital Surgical staff conference Amphitheater

WEDNESDAY JUNE 8

8 a m Massachusetts General Hospital Grand rounds Orthopedic department

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9 a m Massachusetts General Hospital Surgical grand rounds
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JUNE 2—New England Society of Physical Medicine. Page 902 issue of May 26

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JUNE 10 and 11—American Heart Association. Page 707 issue of April 21.

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JUNE 20-24—Canadian Medical Association. Page 902 issue of May 26.

JUNE 23—Pentucket Association of Physicians. Hotel Bartlett, 95 Main Street, Haverhill 8 30 p m

SEPTEMBER 12 14—American Association for the Study of Gout. Page 545 issue of March 24

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DISTRICT MEDICAL SOCIETIES

HAMPDEN

Meeting will be held on the fourth Tuesday in July

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Meeting will be held at 11 a m on July 21

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VOLUME 218

JUNE 9, 1938

NUMBER 23

CONSERVATIVE METHODS IN THE SURGERY OF THE CHRONICALLY AND SEVERELY INFECTED KIDNEY

DAVID M. DAVIS*

PHILADELPHIA

I BELIEVE that no one will deny the statement that, of the commoner operations of urology, nephrectomy for pyonephrosis is accompanied by the highest operative mortality. I have found difficulty, however, in determining what this mortality actually is. The term "pyonephrosis" is applied by different persons to different things, the figures given vary tremendously and must, therefore, be regarded with a shrewdly appraising eye. This condition can best be illustrated by a series of mortality figures obtained from the literature. The number of reported series, especially in recent years, is small, as is easily understandable, for the surgery of pyonephrosis is beset with tragedies, it is an unpleasant subject, and there have been no startling therapeutic improvements to encourage the surgeon. The one technical change which has marked a definite advance is preliminary nephrostomy followed by secondary nephrectomy. This procedure has undoubtedly saved many lives, but it is hard to say, from the statistics, just how many.

Table 1 gives the death rates for nephrectomy for pyonephrosis, without regard to whether the nephrectomy was primary or secondary. The figures of Beer, Hryntschak, Scholl and Judd, and Schmidt fall considerably below the others. Hryntschak, as will be seen later, reports a mortality of 29.4 per cent following nephrostomy for pyonephrosis, so that his 24 successful nephrectomies may be regarded as a bit of good fortune. In analyzing the large series of Scholl and Judd, one notes that there were 468 lumbar nephrectomies, including 6 transperitoneal nephrectomies. Of these 54 were extracapsular and 114 subcapsular. Preliminary nephrostomy was carried out in only 7 cases. There were 63 perinephric abscesses, of which 38 were drained some time before the nephrectomy. There is no definite statement of the criteria for the diagnosis of pyonephrosis.

*Professor of genitourinary surgery, Jefferson Medical College; attending genitourinary surgeon, Jefferson Hospital.

Read before a meeting of the New England Branch of the American Urological Association, Boston, November 18, 1937.

Bantz, who has made the most careful statistical study of the subject, finds that there has apparently been a marked improvement in the mortality figures since 1929. He guesses that this improvement is due to better preoperative and postoperative care, particularly ureteral catheter drainage and attention to the fluid balance. However, lumping all the data he has been able to collect, he reaches a combined mortality figure of 27 to 30 per cent for nephrectomy for pyonephrosis.

Table 1 *Mortality Rates in Nephrectomy for Pyonephrosis*

	%
Gerster	14.7
Beer and Hyman (85 cases)	4.7
Hryntschak (24 cases)	0
Bantz (66 cases)	21.2
Bantz (1929-1932)	12.5
Bantz stone (34 cases)	29.1
Rühmer (31 cases)	12.9
Schmieden (138 cases)	23.8
Scholl and Judd (471 cases)	2.5
Schmidt (77 cases)	7.8
Schede (11 cases)	27.2
Combined mortality	27.0-30.0

Table 2 shows those series in which primary nephrectomies are separated from secondary nephrectomies, that is, those done after preliminary nephrostomy. Most of these figures are older, and they run distinctly higher than those in Table 1.

Table 2 *Mortality Rates in Primary Nephrectomy for Pyonephrosis*

	%
Küster	17.0
Gerster (30 cases)	10.0
Schmieden	30.1
Collected by Beer and Hyman	17.0-21.0
Israel	23.0
Bergmann	43.9
Otto	38.8

Table 3 shows the figures for secondary nephrectomies. They are quite comparable with those in Table 2, being in about the same chronological period. The advantages of preliminary drainage appear to be about offset by the fact that the cases so treated are usually more severe.

upon the amount of hemorrhage immediately following a sprain

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nephrectomy can never have a standardized classical technic for the reason that the conditions it must meet vary too much to admit of this."

In trying to evolve from these intricacies some method of classification which will permit us to evaluate more accurately the success or failure of surgical treatment, I have despaired of achieving a pathological classification simple enough to be useful. It seems to me that surgeons would do better to classify their cases according to the method of operation adopted, which will permit us to advance by studying carefully the diagnostic means of determining which form of operation will be best, and perhaps by developing new or modified methods of operation suitable to the conditions present.

The operations commonly listed as available under these circumstances are lumbar extracapsular nephrectomy, lumbar intracapsular nephrectomy, transperitoneal nephrectomy and permanent nephrostomy.

It often appears to me that a number of surgeons have come to believe that nothing but nephrectomy is permissible. Facing such a case, they have felt that however reluctant one may be, he must proceed to remove the kidney, and that to maintain his professional reputation he must complete the removal, even if in so doing he inflicts trauma which is almost sure to prove fatal. I wish now to ask whether it would not be better to admit frankly that in some cases it is beyond the power of any human being to remove the kidney and save the patient. This being so, we should study and develop other possible methods of giving relief. Such methods actually do exist, and I venture to hope that they may be amplified and improved in the future.

Keeping in mind the assumption that formal nephrectomy may possibly be avoided, if there is good reason for so doing, every effort should be made to obtain the most complete information about the condition present. In some cases the patient's illness may be so severe that immediate operation—usually nephrostomy—is necessary. If so, studies can be carried out later in the manner I shall presently describe. If the illness is not so severe, the usual thorough urologic study is of course carried out. There is no need to go into details about this, but I should like to call attention to an observation made recently which seems to be of some importance. It was made in the case of a woman of fifty who entered the medical ward of the Jefferson Hospital complaining of weakness, malaise, pallor, loss of appetite and slight daily fever, with no localizing symptoms. Pus was found in the urine. A badly infected pair of tonsils was removed without improvement. Urologi-

cal study was then carried out, and the pyelogram shown in Figure 1 was obtained. The patient received several blood transfusions, after which, her condition being improved, operation was performed. The operator was Dr. Walter W. Baker, and I was present at the operation and concurred in the decisions made. We believed that nephrostomy was probably the correct procedure, but decided to explore the kidney with the idea that if it separated easily, primary nephrectomy might be carried out. When the kidney was exposed, the presenting surface was not adherent at all, and separated with great ease from the perirenal fat



Figure 1 *Right pyeloureterogram showing two large round dilated calyces and at least three small irregular cavities near the hilum*

After this encouragement the dissection was continued, but as we approached the region of the hilum very dense adhesions were encountered. A few of them were separated, when it became evident that the ureter and pedicle were embedded in a solid, extremely firm, fibrotic mass. We felt sure that the patient was in no condition to withstand either the separation of these adhesions or an intracapsular nephrectomy, so we concluded the operation, leaving a drainage tube in the pelvis of the kidney. The patient suffered a circulatory collapse after the operation, from which she recovered after a transfusion, but the collapse recurred the next day and death resulted. Her resistance was even less than we had estimated. On returning to the pyelogram after the operation, it appeared to me that this whole situation was clearly shown in it, and that the findings at operation

Table 4 shows some figures as to the results of simple nephrostomy for pyonephrosis. They are all old, and appear to the modern surgeon quite high.

Table 3 *Mortality Rates in Secondary Nephrectomy for Pyonephrosis*

	%
Tuffier	5.9
Gerster (31 cases)	19.3
Beer and Hyman (18 cases 13 subcapsular)	11.1
Collected by Betz	17.5
Schmieden	18.0
Israel	50.0

Table 5 shows all the figures I could find on the two-stage operation taken as a whole.

It is obvious that figures such as these are confusing and unsatisfactory, and do not permit the establishment of proper standards for the treatment of pyonephrosis. The reason is not hard to discover. The term "pyonephrosis" has always been inexact from the pathological point of view, and unsuitable from the surgical point of view.

Table 4 *Mortality Rates in Nephrostomy for Pyonephrosis*

	%
Küster	17.0
Tuffier	23.3
Hrynschak (17 cases)	29.4

There is no distinct dividing line between pyonephrosis and infected hydronephrosis, and when we say "pyonephrosis" we convey no information whatever as to the existence or severity of complications which may be present, and which are of the utmost importance to the surgeon.

As a matter of fact, it makes little difference to the operator whether the obstructed kidney is filled with pus or with clear, sterile urine, so long

Table 5 *Mortality Rates in Two-Stage Operation for Pyonephrosis*

	%
Tuffier	29.2
Chute (20 cases)	10.0

as there is no perinephric inflammation. We might then create a group of pyonephroses devoid or almost devoid of perinephritic changes. In this group the operative difficulties are minimal. The disease is apt to be of comparatively short duration, but even if the infection is so acute that the patient is extremely ill, and preliminary nephrostomy is the prudent course to follow, the secondary nephrectomy should be easy. The results in this group should be good, provided the opposite kidney is healthy. In short, I believe it would tend to clarify the situation if we abandoned the term "pyonephrosis" for this group and classified the cases as infected hydronephroses, regardless of the character of the contents of the kidney.

This would leave another group in which the extension of the inflammation to the perinephric tissues plays a most important role. Abscesses may occur, and may be single or multiple, large or small, but fibrosis is inevitable, and it is this that determines whether the surgical problem is to be easy or difficult. The fibrosis may involve the entire area about the kidney in an approximately uniform manner, or may be more pronounced in certain areas and less in others. The area most apt to be more densely adherent is that around the hilum of the kidney, where the pedicle, pelvis and ureter are involved. In only a few cases is the fibrosis sharply localized at one point. It may be very extensive about the kidney, and yet not obliterate the line of cleavage between the kidney proper and the inner surface of the true capsule, even though the latter be greatly thickened. It is upon this pathological fact that the operation of subcapsular or intracapsular nephrectomy is based. It avoids the separation of dense and widespread adhesions, in which lies the danger of producing traumatic shock, or injuring other vital organs such as the vena cava, aorta, pleura, intestine, pancreas, liver, and so forth.

This operation, however, does not solve all the problems. With increasing damage to the kidney, the line of demarcation between it and the capsule may be partly or entirely obliterated, and in the extreme degree of this change, nothing may be left but an infected cavity representing the pelvis, surrounded by a dense mass of scar tissue in which it is difficult or impossible to find, even with the microscope, any remnant of kidney tissue. To speak of performing nephrectomy in such a case must be regarded as the result of wishful thinking, because there is really no longer any kidney—it has been destroyed and its boundaries cannot in any way be determined.

In formulating the problem presented by such kidneys, three other factors must be considered. First, there may be a congenital anomaly of the kidney, such as horseshoe kidney, double kidney, ectopia, or polycystic disease, all of which increase the responsibilities and difficulties of the surgeon. Secondly, there may be disease of the opposite kidney, which requires simultaneous treatment or restricts the alternatives available to the surgeon. Thirdly, general disease may be present, and diminish the ability of the patient to withstand extensive surgical procedures.

It must be obvious from this exposition that even in the restricted group of pyonephroses complicated by perinephric fibrosis there are the greatest variations in operative suitability and consequently in prognosis for recovery from operation. It is indeed true, as Chute has said that "secondary

tions injected in the drainage tube will tell us whether any of the pelvic contents are reaching the bladder. Roentgenographic studies are the most instructive. While ordinary retrograde pyelography is possible in many cases, it is usually easier to inject the pyelographic medium directly through the drainage tube. Fluoroscopic observation during the injection shows whether any of the fluid reaches the bladder, and if so, how easily. If the tube is clamped or plugged, one can see how quickly and completely the pelvis empties. Lastly, if there is any chance that ureteral drainage has become adequate, blocking of the drainage tube for twenty-four hours or so answers the question. It is by careful attention to these methods and thoughtful interpretation of the findings that we may hope to make the accurate and reliable preoperative diagnoses which will permit the selection of the best and least dangerous procedure to relieve the patient.

I can add to the literature no large body of statistics on the surgery of pyonephrosis. However from the records I have available, I have taken 12 cases which I think can fairly be placed in the category of the extremely difficult cases of pyonephrosis with extensive perinephric fibrosis. I have eliminated all frank renal tuberculosis, and a few other cases in which severe perirenal fibrosis was present, but was due to causes other than pyonephrosis, such as trauma. Of these 12 cases, 4 had, in addition, perinephric abscess. Three cases were treated by extracapsular nephrectomy, with 1 death from peritonitis a week after the operation, and 1 other case in which secondary complete ureterectomy was necessary to obtain a cure. One case, with a double kidney and dilated ectopic ureter opening into the urethra, was treated by nephrostomy, followed by resection of the diseased half of the kidney. The ureter was not removed and by good fortune gave no trouble. In 2 cases nephrectomy was attempted and abandoned, and both these patients died. One case has been described, and the other occurred a good many years ago. I now believe that nephrectomy should not have been attempted in the latter case. Autopsy showed complete fibrosis of the kidney and obliteration of the line of cleavage. One case treated by intracapsular morcellation, 3 treated by nephrostomy and subsequent ureteral dilatation and 2 treated by prolonged drainage gave excellent results and will be described in greater detail. The last 5 of these cases represent the sort of conservative handling which may perhaps come to be granted a place in the treatment of these difficult cases.

Case 1. A 37-year-old married woman had never been pregnant, but a gynecological operation had been per-

formed 4 years before. One year before admission there began pain in the right upper quadrant, radiating to the groin, and frequent and painful urination. During the year she lost 70 lb., becoming extremely emaciated. There

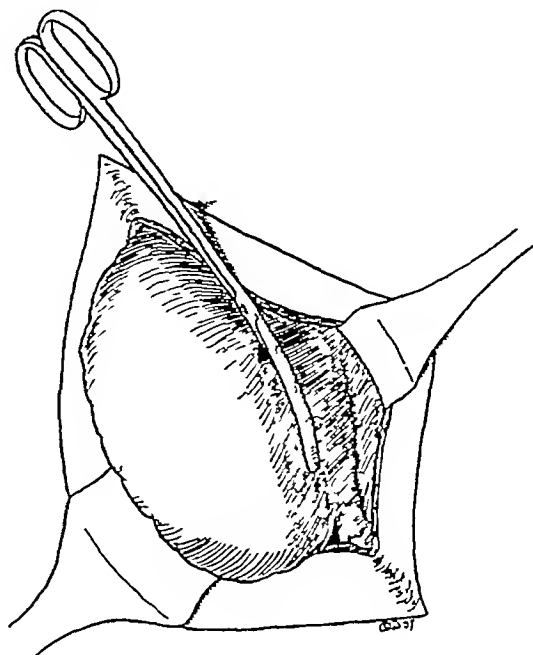


Figure 2 Diagrammatic representation of the operation performed in Case 1. One blade of the clamp has been thrust into the kidney near the hilum. The reflected and thickened capsule is not shown.

was a large, tender mass in the right kidney region and an irregular fever. Immediate nephrostomy was performed, with release of nearly a quart of pus. Both pus

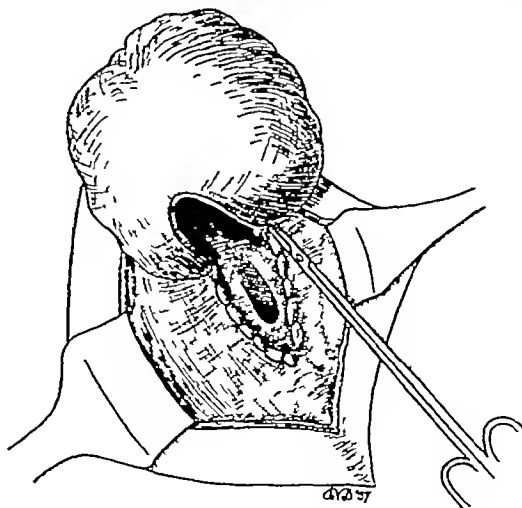


Figure 3 Operation partly completed. The hemostatic sutures and ligatures are shown.

and urine contained *Escherichia coli communis*. Improvement was rapid and uninterrupted. The drainage tube was unfortunately removed by her family physician after 3 or 4 months, but the fistula remained open and at the end

might have been foreseen. As you will note in the picture (Fig. 1) there are in the upper and outer parts of the kidney two large, round, smooth cavities, evidently dilated calyces, while below and medially situated are several very irregularly shaped cavities, each much smaller than the round cavities. The pressure in a closed cavity is the same at all points, and the good distribution of the pyelographic medium shows that all parts of the pelvis communicate freely with one another. Therefore, the appearance of this pyelogram can only mean that the upper and outer calyces have dilated freely and easily and without hindrance from any fibrotic change in the capsule or perirenal tissues, while in the more central portion of the kidney the calyces have dilated but slightly and irregularly because they are surrounded and confined by an extensive fibrotic change. Had we observed this fact, we should have made a simple and rapid nephrostomy, and it is quite likely that the patient's life might have been saved. Since this incident, I have restudied a number of pyelograms, and believe that it may be possible to draw from the nature of the pelvic outline fairly accurate inferences as to the degree and location of perinephric fibrosis.

If the surgeon believes that secondary nephrectomy is or may be for any reason inadvisable, and wishes or hopes to avoid it, the nature of the problem depends upon whether or not the kidney is still able to secrete urine.

If the kidney is still secreting considerable quantities of urine, nephrectomy can be avoided only by providing adequate drainage. Unless we accept the undesirable alternative of a permanent nephrostomy, this may be accomplished only by restoring the function of the ureter, by dilatation or by plastic operation. In considering this matter, we should remember that in the early days of urology the great pioneer Albarran recognized the possibility of restoring ureteral drainage, and attempted to place a retention catheter, as large as possible, in the ureter at every nephrostomy. The infection is not necessarily an insuperable obstacle. Let me observe that if an infected kidney can be kept under control by drainage through a rubber tube, it may be controlled equally well by thorough drainage through the ureteral tube.

If the kidney secretes only a small quantity of urine, efforts may be made to remove remaining portions of parenchyma by fragmentation, to interfere with the remaining blood supply, or to cause atrophy by the application of chemicals or deep x-ray. Chemicals such as tannic acid, weak formaldehyde and trichloroacetic acid have been suggested, but I have had no experience with them. Schofield speaks highly of the value of x-ray for

this purpose. If such efforts are successful, urinary secretion is permanently suppressed, and the considerations outlined in the next paragraph then apply.

If the kidney produces no urine, we are simply dealing with an infected cavity. This cavity may be only the renal pelvis, but if there is a low ureteral obstruction, it may be the pelvis and a dilated ureter, or there may be added the cavity of a perinephric abscess. Whatever it is, it will heal if adequate drainage is provided for a sufficiently long period. The drainage aperture must be of generous size, and drainage materials must be kept in place until firm healing occurs from the bottom of the cavity.

In all such cases very careful thought must be given to the ureter. If the ureter is not dilated, we may assume that the obstruction giving rise to the pyonephrosis is at or near the ureteropelvic junction, and no especial attention need be given the ureter. If, on the contrary, the ureter is dilated, it cannot be disregarded, no matter what kind of surgical attack is employed. The nature of the obstruction then becomes important. If it is a dilatable stricture, suitable dilatation may have very favorable effects, and indeed change the whole nature of the problem. If the obstruction is for any reason not amenable to dilatation, we must deal with the ureter in some positive way, and it is often desirable to do so before attacking the kidney. This is true even if an intracapsular nephrectomy is contemplated, as in this operation ureterectomy is difficult or impossible. The ureter can be dealt with by some plastic or other operation designed to restore its patency, by removal through an inguinal incision, or, if neither of these is possible, by bringing it to or near the surface and draining it thoroughly. Such operations should be carried down to the point of obstruction, wherever it is, as a retained lower end of the dilated ureter is much more apt to give trouble than the upper end. Neglect of the ureter does not always result in failure of an operation on the kidney, but often enough so that no prudent surgeon should be guilty of such neglect.

In deciding what to do in the region of the kidney, observations at the operating table are of the greatest value, as there is no other absolutely certain way to determine whether the kidney falls within the extremely difficult classification. If nephrostomy is done, numerous and extremely valuable methods of study are available after drainage has been provided. The presence or absence of urine in the drainage can be determined. In doubtful cases, the urea content is decisive. Functional studies can be carried out with phenolsulfonphthalein or indigo carmine. Colored solu-

Case 3 A 47-year-old man entered the surgical ward of the Jefferson Hospital complaining of extreme pain in the right side of the abdomen, with muscular rigidity, fever and leukocytosis. An emergency laparotomy was performed, and an essentially normal appendix was found. A mass was palpated in the region of the right kidney. The symptoms continued and in fact grew worse, with high fever and chills, so that a few days later, after transfer to the Urological Service, operation on the right kidney was necessary. Figure 7 shows the intravenous urogram



Figure 7 Case 3 Right pyeloureterogram. Note the large opaque mass occupying the right half of the upper abdomen, the dilated pelvis and the mottled appearance due to a poor mixture of the pyelographic medium with thick pus. The arrow marks a ureteral calculus.

with dilated pelvis lying in a large area of density, and a questionable stone shadow in the region of the lower ureter. A large perirenal abscess was found, with marked fibrotic changes about it. Beneath the abscess could be palpated a large, flabby kidney, and a fistula was found leading to the pelvis. The abscess and the kidney pelvis were drained with rubber tubes. Improvement was immediate and pronounced, and subsequent pyelographic studies, made by injecting the medium through the drainage tubes, showed the pelvis enlarged, and the ureter dilated down to a point just below the iliac artery, where a good sized calculus was lodged. The patient felt so well that he importuned us to remove the tube, but this was not done until, as a result of repeated ureteral dilatation as high as 16 French, the stone was passed. Since the injection of colored fluid now demonstrated excellent ureteral drainage, the tube was removed. The sinus immediately closed, and the state of well-being was such that the patient neglected the advice given him to undergo systematic ureteral dilatation. He gained about 30 lb,

but in about 4 months fever and pain recurred and the loin sinus reopened and discharged large amounts of pus. There was some difficulty in passing an instrument up the ureter, but once it was accomplished the sinus healed at once. Subsequently the ureter was dilated at increasing intervals with a No 14 bulb, and the patient has remained perfectly well. Figure 8, an intravenous urogram, shows



Figure 8 Case 3 Intravenous urogram. The ureter has been dilated, the stone has passed and the nephrostomy tube has been removed. Note the small size of the pelvis and the sharp calyces.

how markedly the right renal pelvis had contracted and returned toward normal.

Case 4 A 54-year-old man had had for 16 years recurrent attacks of pain on the right side, and 10 years before admission a large stone had been removed by operation from the right kidney. Two years later he had passed blood. For 7 years he had been known to have diabetes, which was controlled by dietary treatment. For 5 years he had passed blood and pus at frequent intervals and had lost 50 lb. For 3 weeks there had been pain in the right side, fever to 101°F and hematuria. Examination showed the typical features of horseshoe kidney (Fig 9), with marked hydronephrosis and hydroureter on the right, narrowing of the ureter at its lower end and a few stone shadows in the kidney area. The urine contained pus and a few streptococci. Urine from the left pelvis was normal, with excellent function (Fig 10), but only a trace of phenolsulfonphthalein came from the right side. An operation, planned to be a heminephrectomy, was carried out. After a very thick Gerota's capsule had been cut through, a large perinephric abscess

of 6 months there were no bad effects, except that x ray studies were rendered impracticable. Secondary nephrectomy was attempted. The capsule was 2 cm thick and very tough, and the ureter, pelvis and pedicle were imbedded in such extensive masses of scar tissue that it was

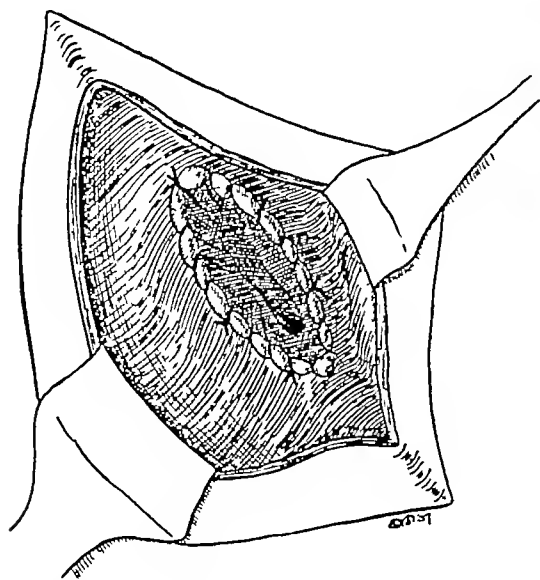


Figure 4 Operation completed The pelvis is left widely open, drains were placed well down into the pelvis

considered unsafe to free them. After dividing the capsule and pushing it away from the kidney as well as possible, one blade of a large curved clamp was thrust through the kidney cortex into the pelvis as far down toward the hilum as possible (Fig 2). The kidney was cut away above the clamp. By repeating this process, the entire pelvis was encircled (Figs 3 and 4). Hemostasis was obtained by mattress sutures or ligatures, according to the length of the bite of the clamp. The entire extrarenal pelvis, ureter and pedicle were left behind, but all parenchymal tissue appeared to have been removed. Drains were placed in the pelvis. A tube was kept in place about 2 months, being shortened only as it was forced out by the healing process. By this time healing was complete, and the patient has remained perfectly well and free from symptoms. I include this case to illustrate a variant in the method of performing intracapsular nephrectomy. It has probably been used before, but I have not found a description of it.

Case 2 A 53-year-old woman had severe pain in the right kidney region, with fever and chills. Examination showed the right kidney pelvis dilated and filled with pus, and the pyelogram (Fig 5) aroused a suspicion of polycystic kidney. The patient was so ill that a right nephrostomy was done, at which time the diagnosis of polycystic kidney was confirmed. While she was convalescing from this operation the other kidney became heavily infected, and left nephrostomy was necessary. The pelvis again was found to be full of pus (Fig 6). Ten days later the fever recurred, and exploration revealed a large abscess around the upper part of the left ureter. This was drained, and all the drains were maintained for nearly 8 weeks. During the first half of this period the patient had continuous high fever and chills, but after these subsided the ureters were cautiously dilated, as it was out of the



Figure 5 Case 2 Right pyeloureterogram showing dilatation and deformity characteristic of a polycystic kidney. The ureter is irregular, but not markedly dilated.

question to consider removal of either kidney. As a result of this, all the sinuses healed and the patient was able to leave the hospital in good condition, although of course the urine was still infected.



Figure 6 Case 2 Left pyelogram showing dilatation and deformity.

and was greatly dilated and convoluted in its lower portion, which extended almost to the bladder (Fig 12) I felt that nephrectomy, to be successful would have to be preceded by removal of this hugely dilated and infected ureter. This was accordingly undertaken, and was found to be very difficult. The peritoneum was extensively torn. A small portion of the lower end of the ureter had to be left in place, and was thoroughly drained. The upper end

were extruded by the healing process, and no urine was ever detected in the drainage. Both sinuses were completely healed 4 months after the last operation. The patient was under observation for 6 months after healing was complete. He felt very well, had no symptoms and gained much weight. The mass in the right kidney



Figure 11 Case 4 Right pyeloureterogram made by injecting Skiodan solution through the nephrostomy tube. The ureter has been dilated. Note the small size of the pelvis and that most of the solution is in the bladder.

was brought as near the surface as possible and drained with a large tube. This procedure was so arduous that it was considered wise to postpone the attack on the kidney. The incision healed per primam, and 3 weeks later the old sinus was excised and its lower portion split with a view to intracapsular nephrectomy. Neither kidney tissue nor line of cleavage could be found although the cavity representing the pelvis was widely opened. During this dissection several small arteries were divided and either ligated or closed by packing. This may have assisted in completing the atrophy of any small remnants of secreting tissue remaining. The entire large mass of scar tissue could have been removed only by sharp dissection, and I considered this unjustifiable in the absence of all landmarks, so that large drains were inserted and the operation was concluded. The drainage sinus from the lower end of the ureter healed very promptly. Drainage tubes were kept in the sinuses leading to the upper end of the ureter and to the kidney pelvis until they

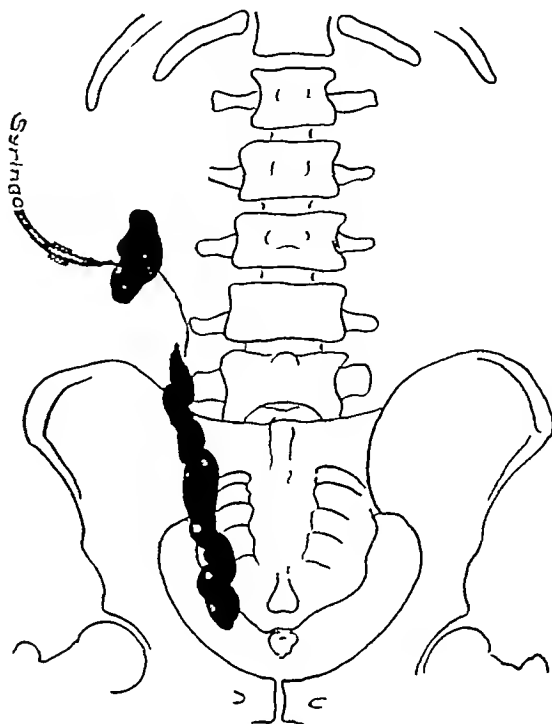


Figure 12 Case 5 Diagram representing the x ray findings after injecting Skiodan solution through the drainage sinus. Note the large dilated ureter and that no solution has entered the bladder.

region was not tender in the slightest degree, and became markedly smaller. I feel that this treatment was by far the best solution for this young man, and cure would have been impossible so long as the dilated ureter remained in place.

Case 6 A 43-year-old, married woman, with two children, complained of frequent, painful and urgent urination for 2 years, and a painful and tender swelling in the right flank for 5 weeks, with loss of weight of 10 lb. Seven years before she had been told that she had a floating right kidney. Ureteral catheterization was impossible. At operation a perinephric abscess was found, extending down into the iliac fossa. It and a large pyonephrotic cavity were drained. Following the operation, no urine was detected in the drainage at any time. A pyelogram was made by injection through the tube (Fig 13), showing a dilated pelvis. There was no ureteral filling, so that the underlying obstruction was undoubtedly at or near the ureteropelvic junction. The patient did so well that nephrectomy was attempted 9 days later. The operation note made at this time states:

"The incision has healed in a remarkable way in spite of the presence of so much pus. There has never been any sign of urinary drainage. The old incision is reopened with some difficulty. The perirenal fat is extremely indurated. Efforts are made to dissect down

was opened. Within the abscess lay the kidney, which was densely adherent. It was felt that the circumstances, including the existence of the isthmus, did not permit intracapsular nephrectomy, and indeed that the excessively dense adhesions in every direction would prevent one from ever removing the kidney with any degree of safety. Drainage tubes were therefore placed in the abscess cavity

necessary, after which dilatation was eventually carried to No 16½ French. The posterior edge of the vesical orifice, which was prominent, was incised with the Collings electrode. After this, fluoroscopic examination showed that Skiodan solution injected in the nephrostomy tube passed quickly and completely to the bladder (Fig 11)



Figure 9 Case 4 Right pyeloureterogram showing a dilated pelvis mottled appearance a deformity characteristic of a horseshoe kidney and a dilated ureter with stenoses in the lower third. The lower border of isthmus can be seen



Figure 10 Case 4 Left pyeloureterogram showing some dilatation and deformity characteristic of a horseshoe kidney. Note the absence of a mottled appearance in the pelvis

and in the pelvis with the idea that the nephrostomy would probably have to be made permanent. The convalescence was extremely complicated. The diabetes was difficult to control. Subacute postoperative gangrene developed in the incision, requiring a wide excision of skin and subcutaneous tissue, protracted dressing with zinc peroxide paste and eventual skin grafting. First one epididymis and then the other became acutely inflamed, but neither suppurated. Acid fast bacilli were found in the urine once, but later studies were negative. These misfortunes kept the patient in the hospital 3 months, during which time purulent urine drained constantly from the nephrostomy tube. I decided to attempt to restore ureteral drainage, hoping to be able to dilate the stenosis demonstrated in the lower ureter. Ureteral meatotomy was

The tube was therefore tightly corked for 3 days, with no untoward symptoms whatever. It was then considered safe to withdraw it, and the fistula healed promptly. Eight months later the patient had gained 50 lb, felt very well with no symptoms whatever and was hard at work. The urine still contained pus and a few streptococci. I feel that further operation in this case would have been unjustifiably dangerous, and although an infected kidney is still present, it can be controlled by an occasional ureteral dilatation.

Case 5 This patient was a 26-year-old man, at the age of 5, a large right hydronephrosis had been drained, and the resulting sinus had discharged purulent material ever since. Two subsequent operations had been performed at one of which a large stone had been removed, and possibly part of the kidney. Examination showed a large, irregular mass beneath the sinus. The urine was perfectly normal and the right ureter evidently completely occluded, as no ureteral orifice could be found with the cystoscope. The sinus was injected with Skiodan solution and was observed under the fluoroscope, and films were taken. They showed an ovoid mass beneath the sinus, and in the middle of it the Skiodan outlined an irregular kidney pelvis with large, rounded calyces. The Skiodan had also penetrated the ureter, which was very narrow near the kidney,

parenchyma left, and one need not worry about hemostasis. The blood supply is much less than normal, the situation is less formidable, and the control of the blood supply is easy.

The other problems are very diverse and very complicated. I am rather surprised that Dr. Davis has not found abscesses working downward. In our series there were perirenal abscesses gravitating as far as Poupart's ligament. The whole flank was transformed into an infected space. There is no doubt that conservative treatment is the proper kind so long as it is really conservative. In some cases if the patient seems not to be doing well a nephrectomy should be performed.

The problem of the bilateral case is a very difficult one. In my group of 150 cases, 80 or more were associated with stones in one way or another. They either formed the inciting cause of the pyelonephrosis or were incidental to it.

DR. E. GRANVILLE CRABTREE. In the handling of this group of cases Dr. Davis has brought out many important points. I wish to emphasize the necessity for prompt secondary operation in case it has to be done. In approximately a month's time the patient has had the advantage of adequate drainage of the suppurating process, even in cases where the process is in the parenchyma of the kidney itself. At the end of this time, one does not find the dense scar tissue which makes secondary operations almost impossible. I note in one of Dr. Davis's cases the great difficulty in handling scar tissue. I make an effort to reoperate within a month, because later than that the scar tissue becomes very difficult to deal with.

DR. CLYDE L. DEMING. Dr. Davis has clearly outlined the way to handle kidney infections in a conservative manner by two-stage nephrectomies, first draining the ureters and leaving the kidney in. I have recently looked over our list of nephrectomies for pyelonephrosis. There are 35 or more, and there has been only 1 death. This is a better record than I find in the literature. There are large numbers of cases where kidneys have been preserved, and 1 case that I should like to cite. A woman with bilateral pyelonephrosis had only 10 per cent dye excreted in two hours. She was operated on nine years ago by conservative measures and the pus was drained by nephrostomy and later by dilatation of the ureters. The renal function has remained about the same, the patient does her own housework and looks quite well. In cases with pyelonephrosis there have been no deaths from nephrectomy during the last few years, we have tried to treat these cases conservatively by two-stage operations.

I have lost cases by doing a primary nephrectomy and have wondered why there was shock. This occurs within two to twenty-four hours after operation, and there seems to be no way of combating it. Recently there have been reported a number of cases in which the patients died of shock and in which autopsy showed a single adrenal. That brings to my mind a new possibility which I think has not been brought out, namely in some cases where we attempt nephrectomy there is only one adrenal. We all know that we sometimes injure the adrenal in doing a nephrectomy, and it is possible that these deaths may be explained by injury to this single gland.

In doing two-stage nephrectomies one finds a rather

marked diminution in the size of the kidney, so that the operation is very much easier, the line of cleavage is more distinct from the adrenal, and one is less likely to injure the gland in removing the kidney.

Dr. Davis did not bring in the factor of different types of infection in discussing the treatment. I wonder if he has formulated any opinion as to the types of infection in which special kinds of surgical treatment should be applied.

DR. J. DELLINGER BARNEY. Dr. Davis has reviewed the subject most thoroughly. I think one should lay down the rule that each case is a law unto itself. It is surprising that one can leave behind a great amount of inflammatory tissue in the form of perirenal fat and capsule in cases of intracapsular nephrectomy. It is unwise to remove it, and to do so takes as much time as does a whole nephrectomy. I can think of only one or two cases where I have later removed this tissue. Nature seems to have been kind in these cases, and it is poor judgment to take out the tissue when it can be left behind. Some of the older men used to tell me to remove everything possible, but I have found this inadvisable.

Dr. Davis (closing). Dr. Quinby has raised a point which I did not mention, that there are a few cases which do not do well after nephrostomy drainage. That is true, and I think it is due to the conformation of the kidney pelvis itself. It may be difficult to obtain good drainage by a single drainage tube or even two. I recall one case where it was obvious that nephrostomy drainage would be unsatisfactory, and I proceeded to perform a primary nephrectomy. The patient was extremely ill and I feared she would die of operative shock, but fortunately she made an excellent and rapid recovery. I think this was one case which would not have done well with nephrostomy drainage.

Dr. Crabtree speaks of the time of secondary operation. I agree with him. The patient who was operated on six months later went too long, owing to her failure to return at the recommended time. On the other hand in a good many cases the patient is so debilitated because of the first illness that one feels it desirable to postpone secondary operation until the patient's condition has improved. Patients are often quite emaciated and anemic, and it takes two or three months to build them up sufficiently to withstand the operation.

As Dr. Deming has said, one often finds the adrenal extending onto the kidney. In some cases where we have done extracapsular nephrectomy, an intracapsular operation would have been better.

As to the types of infection, those due to *Proteus* bacilli seem to be the most difficult ones to treat. If one can get thorough drainage with two or three drainage tubes and possibly a Dakin's tube as well, and irrigate the kidney with acetic or phosphoric acid in dilute solution, he can deal successfully with a *Proteus* infection.

I was delighted to have Dr. Barney confirm my impression that it is correct to leave large amounts of fibrous tissue behind. If it is necessary to drain, the most important point is keeping the drainage material in place for a long time until the wound can heal from the bottom with granulation tissue. I think it is the early removal of drainage tubes that gives trouble in these cases.

to the kidney around the drainage sinus, but nowhere is any recognizable kidney tissue found or any line of cleavage indicating the capsule. The finger in the drainage sinus feels firm trabeculae characteristic of a hydronephrotic kidney pelvis. Efforts are made in various directions to dissect the kidney and posteriorly the vena cava is exposed. The finger is passed below the lower pole of the kidney, but it is impossible to tell whether this is inside or outside the perirenal fat. The peritoneum is densely adherent to the kidney anteriorly and medially.

"In view of these findings and of the fact that all this palpation discloses no noteworthy kidney sub-



Figure 13 Case 6 Right pyelogram made by injecting sodium-iodide solution through the nephrostomy tube. Another drainage tube is in the perinephric abscess cavity. Note that none of the solution has entered the ureter.

stance, and of the fact that no urine has been secreted through the drainage tube, it is decided not to attempt further to remove the kidney. I feel that removal of the kidney here would be extremely dangerous to the patient's life. A drainage tube is placed in the kidney pelvis and packed around with gauze. A second drainage tube is placed in the abscess in the iliac fossa. Cigarette drain to the postrenal space. Closure by through and through sutures of silkworm gut.

I think that the abscess in the iliac fossa will heal promptly. The tube will be kept in the kidney pelvis as long as possible, preferably 2 to 4 months. I believe that the sinus will then close and there will be no further drainage. Should any further operation be necessary, it should be transperitoneal on account of the destruction of all landmarks about the kidney."

The tissue removed for examination showed no trace of any renal elements. The tube remained in place about

2½ months, when it was forced out by the healing process. The patient has remained well and entirely free of symptoms for nearly a year, and has gained about 30 lb.

* * *

I am sure that every urologist has had experiences similar to mine in dealing with pyonephrosis. When the results have been poor, I believe that they are usually due to the extreme difficulties inherent in the situation. I venture to make a plea that there be more discussion of these difficulties, and of means of circumventing them, and hope that even if my contribution is considered of small importance, it may stimulate further consideration of these knotty problems.

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DISCUSSION

DR. FLETCHER H. COLBY. Dr. Davis has given us a very interesting paper. He brings up a very difficult problem and one which we all meet. His solution is new to me and is probably new to many others. His experience in pyogenic infections of the ureters has been similar to my own, which is that ureters infected with tuberculosis seldom have to be removed, those infected with pyogenic organisms are much more apt to cause trouble.

DR. WILLIAM C. QUINBY. I think we are very fortunate in having such a clear-cut picture of this subject. I had reason to look up this type of case in our clinic rather recently, and while I do not have the exact figures based on the approximately 150 cases operated upon, there was a mortality of 13 per cent, this includes drainage cases as well as nephrectomies of all kinds. The patients are usually very sick, as we all know, and each demands one's best judgment as well as one's most daring operative skill. There is, I think, one thing worth bringing out, that is the importance of handling the infection and at the same time of providing adequate hemostasis. Cases fall roughly into two such groups so far as the diagnosis is concerned. If the infection is relatively recent, and if one finds a very large, swollen, soft, succulent kidney thoroughly infiltrated with pus, the danger is greater than with a kidney whose condition will be changed for the better by prolonged drainage through nephrostomy. However, where there is only a relatively large or small pus sac the problem is that of handling the infection rather than one of vascular supply. As Dr. Davis has pointed out in one or two of the cases he mentioned, there is often very little

with 1 patient in this series, in whom a difficult forceps delivery was complicated by partial inversion of the fundus of the uterus. About forty-eight hours after delivery a tumor mass was palpated in the pelvis which at operation proved to be a walled-off abscess in contact with a small rent in the posterior wall of the bladder.

Disease of the bladder wall is an occasional factor in the causation of rupture. Alton² has reported a case of intraperitoneal rupture wherein at autopsy the entire wall of the bladder was found to be necrotic, owing to tuberculous infection which evidently originated in the left kidney. Dixon and Strohl¹³ report an unusual case of spontaneous rupture of the bladder in a patient with syphilis of the central nervous system.

Saphir and Shapiro³³ reported a case of seemingly spontaneous intraperitoneal rupture in which microscopic examination of the bladder wall showed almost complete replacement of the muscularis with fat. Careful microscopic examination of bladder walls of patients coming to autopsy from diseases not related to the urinary tract showed 2 cases of fatty infiltration in 30 bladders examined, bladder function during life had apparently been normal. These cases suggest fatty infiltration of the bladder wall as an occasional etiologic factor in the production of so-called spontaneous rupture. No such findings were recorded in the present series.

The term "spontaneous rupture" is reserved for cases in which there is no history of trauma and no demonstrable disease of the wall of the bladder. Three such cases were found in this series, of which 1 had a postprostatectomy stricture of the urethra. Genitourinary disease was not demonstrable in the other 2 cases. Of these, 1 was of particular interest in that the patient, a man of forty-eight, was awakened from a sound sleep by sudden, severe abdominal pain which he tolerated for forty-eight hours before entering the hospital. At laparotomy, an 8-cm laceration was found in the dome of the bladder. This was closed after the method to be described shortly and the bladder was drained by means of a urethral catheter. The patient made an uneventful recovery, and when last seen six months after operation he was voiding normally and without residual urine. Cystoscopy at this time showed a perfectly normal bladder mucosa except for the barely perceptible scar at the site of closure.

Two cases of this series showed definite disease of the bladder. In one the bladder wall was infected to the extent that it was described as being phlegmonous. In the other rupture occurred through a diverticulum of the bladder wall.

Table 1 *Etiology of 22 Cases of Intraperitoneal Rupture of the Urinary Bladder*

	NO OF CASES	ALCOHOLIC
Direct trauma to abdomen	12	5
Trauma (type unknown)	2	1
Spontaneous	3	1
Bladder irrigation	1	
Transurethral resection of prostate	1	
Birth trauma	1	
Disease of bladder wall		
diverticulum	1	
phlegmon	1	
Totals	22	7

Table 1 summarizes the etiologic factors responsible for rupture of the bladder in the 22 cases in this series.

PATHOLOGY

In the majority of cases the actual dissolution of continuity of the bladder wall is represented by a linear tear which, even with the bladder in the contracted state, is usually 5 cm or more in length. The laceration, in the majority of cases runs from a point on one side or the other of the posterior wall, obliquely across the dome to the anterior portion of the opposite side. Because of this antero-posterior direction, it is often difficult to effect adequate surgical closure of the posterior extremity of the laceration.

In an effort to determine the mechanism of rupture of the bladder, Besley⁵ injected fluid into the bladders of 6 cadavers, to the point where the bladder wall ruptured. From these experiments he concluded as follows: (1) There is no constant relative order of tearing of the coats of the bladder. (2) When pressure is applied evenly throughout the bladder the wall ruptures at the weakest point, which is not always the same, anatomically speaking, thus, in 5 of the experiments an intraperitoneal rupture was produced, while an extraperitoneal rupture occurred in the sixth case. (3) In no case did the bladder rest against the promontory of the sacrum, so that this bony projection has nothing to do with the mechanism of rupture.

The sudden expulsion of the contents of the bladder into the peritoneal cavity represents a shock which is tolerated surprisingly well. It is not unusual to find cases reported in which recovery has ensued when surgery has not been resorted to until forty-eight to sixty hours after rupture. Indeed, Quick³¹ reported recovery in a case operated upon ten days and fourteen hours after rupture.

The urine itself is irritating to the peritoneum, and sets up a chemical peritonitis which is similar to that following perforation of a peptic ulcer. If the urine is bacteriologically sterile, this chemical insult is well tolerated. However, if the urine is

INTRAPERITONEAL RUPTURE OF THE URINARY BLADDER

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WITH the present-day incidence of automobile and industrial accidents the therapeutic problems incident to trauma to the urinary bladder are becoming increasingly impressed upon the conscience of the profession. Of all the conditions resulting from trauma to the genitourinary organs, intraperitoneal rupture of the bladder is one of the least common, a fact which is adequately explained by the protection afforded by the bony pelvis. Nonetheless, it occurs with sufficient frequency so that all should be familiar with its clinical picture and the therapeutic problems involved, for it presents an emergency that demands immediate surgery if the patient is to survive.

In an effort to evaluate and co-ordinate some of the numerous published opinions as to diagnosis and treatment of this condition, a study was conducted of 22 cases proved at operation or autopsy at the Boston City Hospital during the past twenty years. During the same period 19 cases of extraperitoneal rupture of the bladder have been operated upon. In addition there have been a great many cases of suspected intraperitoneal or extraperitoneal rupture in which, for one reason or another, the exact diagnoses have not been definitely established. These cases have been excluded, with the result that the series is smaller than is desirable for statistical analysis, yet has the great advantage that there can be no doubt as to the exact diagnosis in each individual case.

HISTORICAL

Homer^{10, 20} is credited with having mentioned wounds of the bladder causing death, while Hippocrates stated that such wounds were invariably fatal. For many centuries there was little reason to doubt the accuracy of the latter observation, for in 1882 Rivington²² stated that he doubted whether there had ever been an unequivocal recovery following intraperitoneal rupture. He added that "I do not, in this age of antiseptics, absolutely despair of a time arriving when such can no longer be said." Bell, in 1789, is credited with first having proposed suture of the ruptured bladder, while Grandchamps,¹⁷ in 1826 concluded from animal experiments that the bladder wall could be closed by suture of the muscular and serous coats. By 1888, Grant¹⁸ was able to collect 14 cases of intra-

peritoneal rupture from the literature, all treated by operation. Of these 14 cases there were 5 recoveries and 9 deaths. Since that time there has been an increasing number of case reports, but with few efforts at critical evaluation of the several methods of surgical therapy.

AGE AND SEX INCIDENCE

Intraperitoneal rupture of the urinary bladder can occur in either sex and at any age. Evidence for this statement is found in the present series, which includes a girl of three and a man of seventy-four. As would be expected, however, men between twenty and forty are most frequently afflicted, since they are more exposed to the dangers of trauma and alcoholism. In the series herewith presented there were 16 men and 6 women, a ratio of 3:1. The average age was forty-one years, the male patients averaging forty-five, and the female thirty-two.

ETIOLOGY

Trauma is by far the most frequently encountered etiologic agent in intraperitoneal rupture. The traumatizing force is usually applied directly to the abdominal wall in a person who at the moment has a distended bladder. Since it takes at least 350 cc of fluid to bring the dome of the bladder above the brim of the pelvis, and since this amount of urine is not comfortably tolerated by the normal adult, it is not surprising to find that alcoholism, which not only dulls the sensorium but also causes an increase in urinary output, is very frequently encountered. Of the 22 cases in this series 12 (55 per cent) gave a history of direct trauma to the abdomen (usually a kick in the abdomen, a fall on the abdomen or being crushed between moving objects). Of the 12 cases in which trauma was a major etiologic agent, 5 were in addition alcoholic at the time of rupture. In 2 cases of alcoholism associated with intraperitoneal rupture, no history of trauma could be obtained. This supposed absence of trauma, of course, is open to question. However, in one of these cases the patient was awakened from a drunken stupor by the sudden onset of agonizing abdominal pain, the cause for which was later found to be an intraperitoneal rupture of the bladder.

Intraperitoneal rupture is an occasional complication of the second stage of labor, as was the case

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cause of a valve-like action, the return flow is impeded. The injection test gave positive information in only 4 cases of this series.

The results of simple catheterization may at times give information which is very misleading, as evidenced by Case 22 of this series. The patient was admitted with a history of symptoms of peritonitis with a total anuria of thirty-six hours' duration. On admission, a catheter was passed into the bladder, yielding 60 cc of clear, yellow urine. An hour later a catheter was again passed and yielded 2000 cc of grossly bloody urine. At operation an 8-cm laceration was found extending across the dome of the bladder in an antero-posterior direction. It is evident that at the first catheterization the catheter was introduced into the bladder, which contained a small amount of grossly normal urine. At the second catheterization it was introduced through the rent into the peritoneal cavity, yielding a large quantity of bloody urine which had been intermittently escaping from the bladder since the rupture had occurred.

Keen²⁴ in 1890 suggested the injection of filtered air into the bladder as an aid in diagnosing intraperitoneal rupture. He pointed out that if rupture were present the injected air would escape into the peritoneal cavity and distend the entire abdomen, whereas if it were not present the resulting area of tympany would be confined to the hypogastric area. Walsham is credited by Besley²⁵ as being the first to apply this test clinically, in 1895. Alexander,¹ in 1901, warned against the massive injection of air, stating that if an intraperitoneal rupture were present the inflation of the peritoneal cavity might lead to a fatal syncope. More recently, Vaughan and Rudnick³⁰ have suggested the injection of a small quantity of air (50 to 100 cc.) If intraperitoneal rupture is present a roentgenogram of the abdomen taken with the patient in the upright position will reveal air between the liver and diaphragm, while if an extraperitoneal rupture is present the air will escape into the fascial planes of the abdomen and thighs, where it will be readily visible in the x-ray picture. We have had no experience with either of the air injection tests, but the feasibility of Vaughan and Rudnick's suggestion can hardly be doubted.

Cystoscopy cannot be recommended as a diagnostic aid in the presence of intraperitoneal rupture of the bladder, since at best it is time-consuming and an ordeal for a patient who is already seriously ill. In the occasional case in which the diagnosis is obscure and the rent in the bladder is small or incomplete, cystoscopy may prove to be of value.

TREATMENT AND MORTALITY

As in the case of rupture of any abdominal viscus, the treatment of intraperitoneal rupture of the urinary bladder is purely surgical. In this series there are 3 cases in which no treatment was instituted and which ended fatally. In each case the clinical diagnosis was missed and the condition was discovered only at autopsy. It is probably correct to state that untreated intraperitoneal rupture of the urinary bladder is invariably fatal.

In reviewing the literature relative to intraperitoneal rupture of the bladder, one is astounded at the lack of agreement among authors as to what actually constitutes adequate surgical treatment. For treatment of the actual laceration, most authors have recommended a double row of inverting sutures of catgut. Crosbie¹² and Dixon and Strohl¹³ have, on the other hand, recommended adequate suprapubic drainage of the bladder with no attempt to suture the laceration. Each author reports successfully treated cases. As to whether or not to drain the peritoneal cavity, opinion is similarly divided. In the majority of cases reported a drain has been placed in the posterior cul-de-sac. Cave¹¹ states, however, that "unless there is present a localized peritonitis with abscess formation, drains placed into the peritoneal cavity are of questionable value." O'Neil³⁰ advocates sewing the cavity up tightly without drainage. Smith³⁶ has recently reported a case in which, after careful suture of the bladder, the peritoneum was closed without drainage with good result. Nicolaysen²⁹ reports 1 case treated successfully by urethral catheter drainage alone.

The question of how best to drain urine from the bladder postoperatively is also a mooted one. MacCormac²⁶ reported recovery in 2 cases in which no provision was made for the escape of urine other than by encouraging the patients to void at frequent intervals. Grant²⁸ recommended emptying by means of repeated urethral catheterizations. He believed that even this precaution might be omitted after four days. Campbell⁹ and others^{16, 38} have stressed the importance of liberal suprapubic drainage. However, many successful cases have been reported in which urethral catheter drainage has proved to be entirely adequate.

In an effort to evaluate the relative accuracy of these conflicting opinions, the present series was subdivided according to whether the bladder wall was sutured, whether bladder drainage was instituted, and if so the type of drainage, and finally whether the peritoneal cavity was drained. Vari-

infected, as is frequently the case in the presence of chronic bladder-neck obstruction from any cause, the immediate chemical insult to the peritoneum sets the stage for the subsequent growth of bacteria from the infected urine. A septic peritonitis which carries a high mortality results. Because low-grade urinary infection is frequently present in persons in the older age groups, it is evident that early operation affords the best protection against the dissemination and growth of bacteria in the peritoneal cavity.

As bladder rupture is most frequently the result of trauma, it is to be expected that in many cases associated injuries will be present to complicate the clinical picture. Of the 14 cases in this series in which rupture was due to trauma, 8 showed no other demonstrable injury of clinical significance. Four patients suffered from fracture of the pelvis, of which 1 had in addition a rupture of the sigmoid flexure of the colon. A fifth had a fracture of the os calcis, and a sixth had a compression fracture of the cervical spine.

Campbell⁹ reports that of 166 cases of fracture of the pelvis seen at the Bellevue Hospital, 15 per cent had also a rupture of the urinary bladder, either intraperitoneal or extraperitoneal. On the other hand, 20 per cent of 55 cases of rupture of the bladder, both intraperitoneal and extraperitoneal, had in addition a fracture of the pelvis.

As mentioned under the discussion of etiology, associated genitourinary disease is occasionally present, and more rarely is responsible for the rupture. In this series is reported 1 case of cystitis and diverticulitis, 1 case diagnosed clinically as phlegmon of the bladder, and 2 cases of bladder-neck obstruction, 1 a postprostatectomy stricture and the other a benign hyperplasia of the prostate.

CLINICAL PICTURE AND DIAGNOSIS

The clinical picture of intraperitoneal rupture of the urinary bladder is frequently misleading. The usual picture is one of an acute abdominal catastrophe following immediately, or soon after, a definite trauma to the abdomen. The patient complains of abdominal pain and, very often, marked frequency and urgency of urination, occasionally of anuria. Examination reveals signs of a rapidly progressive peritonitis, with board-like rigidity of the abdominal muscles and generalized tenderness and rebound tenderness. A boggy induration in the posterior cul-de-sac can occasionally be made out on rectal or vaginal examination. The majority of cases give a history of gross hematuria which, in conjunction with the complaint of frequency and strangury, usually points to the genitourinary apparatus as the site of injury. In 21

cases of this series a definite statement concerning the presence or absence of hematuria was noted. Of these, hematuria was present in 13 (62 per cent).

In cases where rupture occurs without trauma, of which there were 5 in this series (including 2 due to disease of the bladder wall), the clinical picture is much the same, although because of its rarity the diagnosis is frequently obscured since the physician does not consider the urinary bladder in association with the sudden onset of peritonitis. In these 5 cases, 3 patients were awakened by the sudden onset of abdominal pain. In the fourth case, rupture occurred while the patient was under observation in the hospital preparatory to an operation for hydrocele. In the fifth the patient was very sick with pneumonia and died without recognizable abdominal symptoms, and intraperitoneal bladder rupture was not suspected until found at autopsy.

Since a history of trauma may or may not be present, the condition must be differentiated from other and commoner causes of generalized peritonitis of acute onset. These include perforation of a peptic ulcer, acute fulminating appendicitis, ruptured ectopic pregnancy, and so forth. In addition, because of the frequency of alcoholism in these patients, acute alcoholic gastritis with its frequently confusing clinical picture must be ruled out.

To aid in the differential diagnosis, in addition to the very important finding of blood in the urine, we have several clinical tests which may at times prove of great diagnostic importance. The first of these is the well-known, but often misleading, injection test, which consists of injecting through a catheter a known amount of sterile fluid into the previously emptied bladder and noting the amount expelled. If the quantity returned is appreciably less than the quantity injected, this fact supports the diagnosis of intraperitoneal rupture. However, the result of this test depends to a great extent on the type and degree of laceration, and a negative result (that is, fluid expelled equals fluid injected) is without significance. This is readily explained, since if the laceration is small only a minor amount of fluid will escape into the peritoneal cavity, and the quantity returned will so nearly equal the quantity injected that the difference will not be readily measurable. On the other hand, if the laceration is large and open, allowing a free interchange of fluid between bladder and peritoneal cavity, the injected fluid entering by way of the bladder will be returned by the same route and again the quantities of injected and returned fluid will be approximately equal. Thus, the only case in which the injection test will be positive is that where fluid injected into the bladder has free access into the peritoneal cavity but, be

cause of a valve-like action, the return flow is impeded. The injection test gave positive information in only 4 cases of this series.

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In an effort to evaluate the relative accuracy of these conflicting opinions, the present series was subdivided according to whether the bladder wall was sutured, whether bladder drainage was instituted, and if so the type of drainage, and finally whether the peritoneal cavity was drained. Vari-

ous combinations of these variables are presented in Table 2. The various groups are too small for statistical comparison, yet give a general conception of the types of treatment adopted together with the results obtained.

Table 2 *Summary of Methods of Surgical Treatment*

BLADDER SUTURE	BLADDER DRAINAGE	PERITONEAL DRAINAGE	RECON- STRUCTED	DIED	MORTAL ITY %
Sutured	Suprapubic	Drained	2	1	33.3
Sutured	None	None	1	0	
Sutured	None	Drained	5	2	28.0
Sutured	Urethral	None	1	1	50.0
Not sutured	Urethral	Drained	1	2	66.6
Sutured	Suprapubic	None	0	1	100.0
Sutured around suprapubic drain	Suprapubic and Urethral	Drained	0	1	100.0
Not sutured	None	Drained	0	1	100.0
No treatment			0	3	100.0
Totals			10	12	55.0

In Table 3, a condensation of Table 2, an effort has been made to determine the importance of the several single factors in surgical treatment. From it we may conclude that the single factor of peritoneal drainage is not of statistical importance in this series if the other factors of treatment are disregarded. Ignoring all points in treatment except that of drainage of the bladder, we find that in cases in which urethral catheter drain-

Table 3 *Evaluation of Methods of Treatment*

	TOTAL CASES	DIED	MORTAL ITY %
Peritoneal cavity drained	15	7	47
Peritoneal cavity not drained	4	2	50
Suprapubic drainage	4	2	50
Urethral catheter drainage	11	4	36
Both suprapubic and urethral catheter drainage	1	1	100
No bladder drainage	3	2	67
Suprapubic drainage plus peritoneal drain- age with or without suture of bladder	3	1	33
Urethral catheter drainage plus peritoneal drainage with or without suture of bladder	9	3	33

age was used a mortality of 36 per cent ensued. Suprapubic drainage, on the other hand, carried a mortality of 50 per cent, while 2 of 3 cases in which no provision for drainage of the bladder was made died, a mortality of 67 per cent.

Disregarding for the moment the method of dealing with the lacerated bladder wall, we find in cases in which peritoneal drainage was established that suprapubic and urethral catheter drainage carried the same mortality—33 per cent. However, when the lacerated bladder wall was sutured and the peritoneal cavity drained, suprapubic bladder drainage carried no mortality in 2 cases. Under the same circumstances, urethral catheter drainage carried a mortality of 28 per cent in 7 cases (Table 2).

From these considerations it is evident that the

treatment of a given case must be governed by the patient's general condition and the findings at operation. In the first place, the type of bladder drainage used is not important statistically provided it is adequate. This means that it must prevent a head of pressure from forming against the suture line. If it is technically possible to effect a sound closure of the laceration by means of a double layer of inverting sutures in a young individual who gives no history of previous bladder-neck obstruction, then urethral catheter drainage is adequate and has the advantage of a quicker post-operative convalescence, since there will be no delay caused by a slowly closing suprapubic sinus. On the other hand, if any doubt exists as to the efficacy of the suture line, suprapubic drainage is undoubtedly safer and the speed of convalescence is of secondary importance.

Similarly, in the young individual subjected to traumatic rupture of the bladder in whom there is no reason to suspect pre-existing urinary infection, and who is operated upon within a reasonable time after the rupture has occurred, it is probably safe to close the peritoneum without drainage. But in the older patient in whom there is a possibility of urinary infection, or in any patient, young or old, in whom operation is for any reason delayed beyond ten hours, drainage of the posterior cul-de-sac should be instituted in an effort to prevent an infectious peritonitis.

As has been stated above, it has been held that after suprapubic drainage of the bladder suturing of the bladder wall is unnecessary. In this series, 1 patient so treated died, as did another when the tube was sutured into the laceration itself. In this respect we are inclined to agree with Cave,¹¹ who states that "the patient's condition warranting, the expenditure of ten minutes' additional time for repair by suture seems more than worth while."

A further factor of greatest importance in influencing the mortality of intraperitoneal rupture is the time elapsing from injury until surgical treatment is instituted. In Table 4 the 19 surgically treated cases in this series have been divided into groups according to the time between rupture and surgical treatment. While the number in each group is small, the tendency for the mortality to increase directly with the time between injury and operation is probably accurate, and speaks for operation at the earliest possible moment.

The mortality for the series of treated cases was 47.4 per cent, which compares favorably with that reported from other clinics.^{5, 9, 23, 28, 37, 38}

SUMMARY AND CONCLUSIONS

Trauma not infrequently associated with alcoholism is the commonest etiologic agent encountered in intraperitoneal rupture of the bladder.

The laceration of the bladder wall usually runs in an anteroposterior direction across the dome of the bladder. Because of the obstacles to exposure, adequate closure of the posterior extremity of the laceration is often difficult.

A discussion of the special tests whereby the diagnosis of intraperitoneal rupture of the bladder

Table 4 *Mortality According to Time between Rupture and Operation*

ESTIMATED TIME	NO OF CASES	RECOV- ERED	DELD	MORTAL- ITY %
Less than 12 hours	6	4	2	33
12-24 hours	7	4	3	43
24-48 hours	2	1	1	50
48-72 hours	0			
Over 72 hours	4	1	3	75
Totals	19	10	9	47

may be definitely established is presented. Although we have had no experience with the suggestion of Vaughan and Rudnick that air be injected into the bladder, the method seems logical and worthy of trial. In the event of intraperitoneal rupture a roentgenogram of the abdomen taken in the upright position will disclose air in the sub diaphragmatic space.

Treatment of intraperitoneal rupture of the bladder is purely surgical and should encompass three aims, namely the treatment of the laceration of the bladder wall, the treatment of the peritoneum, and the method of establishing adequate drainage of bladder urine. A discussion of these factors and their relative importance is presented.

The mortality is directly proportional to the time elapsing between rupture and the institution of adequate surgical treatment.

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Sutured	None	Drained	5	2	28.0
Sutured	Urethral	None	1	1	50.0
Not sutured	Urethral	Drained	1	2	66.6
Sutured	Suprapubic	None	0	1	100.0
Sutured around suprapubic drain	Suprapubic and Urethral	Drained	0	1	100.0
Not sutured	None	Drained	0	1	100.0
No treatment			0	3	100.0
Totals			10	12	55.0

In Table 3, a condensation of Table 2, an effort has been made to determine the importance of the several single factors in surgical treatment. From it we may conclude that the single factor of peritoneal drainage is not of statistical importance in this series if the other factors of treatment are disregarded. Ignoring all points in treatment except that of drainage of the bladder, we find that in cases in which urethral catheter drain-

Table 3 Evaluation of Methods of Treatment

	TOTAL CASES	DIED	MORTAL- ITY %
Peritoneal cavity drained	15	7	47
Peritoneal cavity not drained	4	2	50
Suprapubic drainage	4	2	50
Urethral catheter drainage	11	4	36
Both suprapubic and urethral catheter drainage	1	1	100
No bladder drainage	3	2	67
Suprapubic drainage plus peritoneal drain- age with or without suture of bladder	3	1	33
Urethral catheter drainage plus peritoneal drainage with or without suture of bladder	9	3	33

age was used a mortality of 36 per cent ensued. Suprapubic drainage, on the other hand, carried a mortality of 50 per cent, while 2 of 3 cases in which no provision for drainage of the bladder was made died, a mortality of 67 per cent.

Disregarding for the moment the method of dealing with the lacerated bladder wall, we find in cases in which peritoneal drainage was established that suprapubic and urethral catheter drainage carried the same mortality—33 per cent. However, when the lacerated bladder wall was sutured and the peritoneal cavity drained, suprapubic bladder drainage carried no mortality in 2 cases. Under the same circumstances, urethral catheter drainage carried a mortality of 28 per cent in 7 cases (Table 2).

From these considerations it is evident that the

treatment of a given case must be governed by the patient's general condition and the findings at operation. In the first place, the type of bladder drainage used is not important statistically provided it is adequate. This means that it must prevent a head of pressure from forming against the suture line. If it is technically possible to effect a sound closure of the laceration by means of a double layer of inverting sutures in a young individual who gives no history of previous bladder-neck obstruction, then urethral catheter drainage is adequate and has the advantage of a quicker post-operative convalescence, since there will be no delay caused by a slowly closing suprapubic sinus. On the other hand, if any doubt exists as to the efficacy of the suture line, suprapubic drainage is undoubtedly safer and the speed of convalescence is of secondary importance.

Similarly, in the young individual subjected to traumatic rupture of the bladder in whom there is no reason to suspect pre-existing urinary infection, and who is operated upon within a reasonable time after the rupture has occurred, it is probably safe to close the peritoneum without drainage. But in the older patient in whom there is a possibility of urinary infection, or in any patient, young or old, in whom operation is for any reason delayed beyond ten hours, drainage of the posterior cul-de-sac should be instituted in an effort to prevent an infectious peritonitis.

As has been stated above, it has been held that after suprapubic drainage of the bladder suturing of the bladder wall is unnecessary. In this series, 1 patient so treated died, as did another when the tube was sutured into the laceration itself. In this respect we are inclined to agree with Cave,¹¹ who states that "the patient's condition warranting, the expenditure of ten minutes' additional time for repair by suture seems more than worth while."

A further factor of greatest importance in influencing the mortality of intraperitoneal rupture is the time elapsing from injury until surgical treatment is instituted. In Table 4 the 19 surgically treated cases in this series have been divided into groups according to the time between rupture and surgical treatment. While the number in each group is small, the tendency for the mortality to increase directly with the time between injury and operation is probably accurate, and speaks for operation at the earliest possible moment.

The mortality for the series of treated cases was 47.4 per cent, which compares favorably with that reported from other clinics.^{5, 9, 23, 28, 37, 38}

SUMMARY AND CONCLUSIONS

Trauma not infrequently associated with alcoholism is the commonest etiologic agent encountered in intraperitoneal rupture of the bladder.

The laceration of the bladder wall usually runs in an anteroposterior direction across the dome of the bladder. Because of the obstacles to exposure, adequate closure of the posterior extremity of the laceration is often difficult.

A discussion of the special tests whereby the diagnosis of intraperitoneal rupture of the bladder

Table 4 Mortality According to Time between Rupture and Operation

ESTIMATED TIME	NO OF RECENT CASES	DECEASED	DIED	MAY BE LIVED
Less than 12 hours	6	4	2	33
12-24 hours	7	4	3	43
24-48 hours	2	1	1	50
48-72 hours	0			
Over 72 hours	4	1	3	75
Totals	19	10	9	47

may be definitely established is presented. Although we have had no experience with the suggestion of Vaughan and Rudnick that air be injected into the bladder, the method seems logical and worthy of trial. In the event of intraperitoneal rupture a roentgenogram of the abdomen taken in the upright position will disclose air in the subdiaphragmatic space.

Treatment of intraperitoneal rupture of the bladder is purely surgical and should encompass three aims, namely, the treatment of the laceration of the bladder wall, the treatment of the peritoneum, and the method of establishing adequate drainage of bladder urine. A discussion of these factors and their relative importance is presented.

The mortality is directly proportional to the time elapsing between rupture and the institution of adequate surgical treatment.

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RECENT PROGRESS IN PHYSIOLOGY

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"WE seek truth itself," wrote Claude Bernard¹ in *La Science Expérimentale*, "and if we continue ever to seek it, it is because the part of it that we have already found does not satisfy us" Priestley² also recognized that the scientist's search for truth yielded only fragments, some of them important, and all making up the general body of fact constituting a science when he wrote

In completing one discovery we never fail to get an imperfect knowledge of others, of which we could have no idea before, so that we cannot solve one doubt without creating several new ones

Travelling on this ground resembles Pope's description of travelling among the Alps, with this difference, that here there is not only a *succession*, but an *increase* of new objects and new difficulties

So pleas'd at first the tow'ring Alps we try,
Mount o'er the vales, and seem to tread the sky
Th' eternal snows appear already past,
And the first clouds and mountains seem the last.
But those attained, we tremble to survey
The growing labours of the lengthen'd way
Th' increasing prospect tires our wand'ring eyes,
Hills peep o'er hills, and Alps on Alps arise."

Difficulties of perspective must always concern him who attempts to write on progress in physiology rather than to present a review of the recent literature. Discoveries which seem of the greatest importance when first announced may later be found to be mere foothills hiding from sight a great peak. So also a great discovery, seen unclearly, may appear as an insignificant landmark until great effort and years of progress reveal it in its true stature. The history of physiology is replete with examples of this kind. The discovery of ganglia in the heart by Remak,³ once hailed as the final proof of the neurogenic theory of the heart beat, is the classic example of the first type, while Purkinje's discovery⁴ of the peculiar fibers along the inner walls of the chambers of the heart shows what great importance may some day be attributed to a long-neglected observation.

If one can at all distinguish the contributions in physiology in the past years, it is in the brilliant application of Claude Bernard's insistence on the essential unity of phenomena in living and non-living systems, and the necessity of studying them by the same methods. It will be recognized from

what follows how greatly the physiologist is indebted to the chemist, and especially the physicist, who thus repays the physiologist for teaching him how to make electricity by the union of two dissimilar metals.

THE PHYSIOLOGY OF NERVE AND MUSCLE

Muscular Contractions

Few aspects of physiology have been studied as long or as fruitlessly as that which relates to the intimate nature of muscular contraction. The last few years, however, have seen the development of a method that holds great promise for the future of this subject, namely the method of x-ray diffraction so ably employed by Astbury and his co-workers.⁵⁻¹² Their work is based primarily on earlier demonstrations by the same technic as that which shows that silk fibers are made up of bundles of protein molecules composed of alternate molecules of alanine and glycine in the classic polypeptide linkage of Fischer. From a stereochemical viewpoint, these molecules were shown to be fully extended, and thus incapable of elongation and elastic recoil. The molecules composing hair or other keratin structures, which are known to be elastic over a wide range, were then demonstrated to exist normally in a state of partial contraction owing to the formation of temporary ring structures, probably as a result of attraction between the side chains. When stretched to the limit, these molecules assume a fully extended structure in every way similar to the natural state of silk molecules. Next, it was shown that under the influence of initial stretch plus steam, the normally partially contracted molecules of hair would pass into a still shorter or supercontracted state, again by the formation of further ring structures.

These observations upon keratin were then extended to dried films of the muscle protein myosin, which showed an identical behavior. Such films normally exist in the partially contracted or α keratin state, and can be stretched out to the fully extended or β keratin state. Under the influence of steam and initial tension they also pass into a state of supercontraction. Washed and dried muscle of the foot retractor of *Mytilus edulis* has also been demonstrated to be composed of similar longitudinal bundles of polypeptide chains existing in the partially buckled or α keratin state, and capable of being stretched to the fully extended state.

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The implication is clear that the contraction of muscle may be due to the actual shortening of the molecules of protein which make up the greater proportion of its substance, corresponding to the supercontraction of protein chains in hair and myosin films. That this is actually the case has not of course been demonstrated as yet, but such an explanation would fit in with many of the known facts of muscle physiology. It would, for instance, explain the well-known effect of increased initial tension in promoting vigorous contraction, which finds such striking application in Starling's law of the heart. Bernal¹³ has recently shown how the cross-striations seen in many types of muscle may be accounted for by the twisting of such long molecules along the longitudinal axis of the muscle fiber, an idea also suggested by Tiesgs,¹⁴ and it is not improbable that the change in the cross-striations during muscular contraction is due to a different degree of twisting, associated with a more acutely buckled molecule. The work of Bernal also indicates how ionic changes produced by electrical stimulation or by the action of large positively charged ions such as potassium may bring about shortening of unstable molecules, while such ions as calcium may exercise a stabilizing influence.

*The Compound Nature of the Action Potential and the Reaction to Subthreshold*Stimulation*

The classical researches of Erlanger and Gasser have led to so many basic advances in physiological thinking that to attempt any sort of comparative evaluation is futile. There are two recent developments,^{15, 16} however, which seem to hold infinite promise. The first of these is the elucidation of the compound nature of the monophasic action potential and the association of coincident changes in threshold with its various parts. It is now recognized that the single monophasic action potential is made up of at least four parts: (1) the spike, a brief period of negativity associated with the local discharge of the propagated disturbance, followed by (2) a brief positive afterpotential not always found, (3) a somewhat longer negative afterpotential, and (4) a much longer positive afterpotential. A great many procedures have been employed to demonstrate that these four parts are actually separate processes capable of independent variations.

These portions of the electrical disturbance following discharge of the impulse in an excitable tissue have next been correlated with changes in threshold. It is known that the duration of the spike coincides with the absolutely refractory period, the first positive afterpotential with the relative refractory period, the negative afterpotential with the supernormal period, and the second pos-

itive afterpotential with a prolonged period of relative inexcitability. Thus the classic picture of the threshold changes following a propagated disturbance is enlarged to include a final, fairly prolonged period of heightened threshold of which physiologists had been unaware, and the relation of these changes to alterations in potential is demonstrated.

The applications of these discoveries to many fields have already been numerous, but an especially significant one to simple nerve fibers deserves attention. This is the implication of the second positive afterpotential and the negative afterpotential in the production of rhythmic discharge. In conditions in which the supernormal period is not in great evidence, relatively slow rhythms comparable to that of the heart are set up by the application of constant stimuli, in which the limiting factor seems to be the positive afterpotential. Under circumstances in which the supernormal phase is pronounced, more rapid rhythms or tetany are produced in which the limiting factor is the supernormal phase. Thus an adequate explanation is afforded for the old observation of Wedensky,^{17, 18} who noted that in a fatigued muscle-nerve preparation subjected to tetanic stimulation at a level barely below the threshold, application of a single threshold stimulus was followed by a tetanic response which continued as long as the previously subthreshold stimulus was maintained. In the light of the present work it is recognized that the single effective shock produced a discharge, which was followed by a supernormal period during which the previously ineffective stimulus was capable of evoking a second response, and so on.

The second contribution, implied in work extending over a number of years, but only recently clearly stated, is the demonstration that very similar changes both in threshold and potential follow a single stimulus which is ineffective in producing a propagated disturbance.¹⁹ In the chain of events following such a stimulus only the spike of the action potential and the absolutely refractory period are lacking. The first and second positive afterpotential find representation in coincident increases in threshold, and the negative afterpotential is accompanied by a decrease in threshold.

The first positive potential wave and its accompanying relative refractory period find application in explanation of the Gildemeister phenomenon, in which a single ineffective shock applied to a nerve can render ineffective a second shock following closely after it, even though the second shock alone can be demonstrated to be well above threshold strength. The first shock, although ineffective, had obviously left behind a period of relative refractoriness, which rendered ineffective a

previously effective stimulus. In a similar manner the Wedensky inhibition may be explained.

Recognition of the next phase in the cycle of charges of threshold following a subthreshold stimulus permits an insight into an important physiological phenomenon, loosely termed "summation." It has long been known that during the stage of partial curarization of the myoneural junction a single volley arriving over the motor neuron may prove ineffective, while two volleys, even though fairly widely separated, evoke a response in the muscle. A similar phenomenon has been shown to exist in an isolated nerve trunk, usually over a shorter temporal course, although in certain abnormal conditions summation intervals of several hundred milliseconds are discovered. It is clear that the actual stimulus (that is, electrical shock) is of extremely short duration, and at the neuromuscular junction the spike potential of the nerve ending or the quantum of acetylcholine liberated disappear with almost equal rapidity. It is therefore impossible to speak of a temporal summation of subliminal stimuli in any strict sense. Actually, the first subliminal stimulus, although it quickly disappears, evokes a reaction in the stimulated area, producing, after a short, relatively refractory period, a period of enhanced excitability during which the second, normally subthreshold, stimulus is now effective. It may well be that the second stimulus too is ineffective, but it is in turn followed by a somewhat greater depression of threshold during which a third stimulus is capable of initiating a propagated discharge. There can be little doubt that this concept will prove of the greatest value in all applications of what now must appear to be an inappropriate term "temporal summation."

Humoral Transmission at the Myoneural Junction

The third major advance in knowledge of the physiology of nerves and muscles lies in the application to skeletal neuromuscular transmission of a concept previously applied in the autonomic system to account both for transmission at the synapse between preganglionic and postganglionic neurons and the mediation of the action of the postganglionic activity on the effector systems. Sir Henry Dale, who with his co-workers is largely responsible for this newer concept, has called attention to the fact that DuBois-Reymond²⁰ had suggested that nerves may act to stimulate muscles by liberating at their endings in the muscle a quantum of a chemical substance which is the direct stimulator of muscular activity. The various steps in the development of the subject since then have also been traced in recent publications by Sir Henry Dale.²¹ Their culmination in the discovery by Loewi of a chemical transmitter, later shown to be acetylcholine, in parasympathetic ac-

tivity and of a sympathetic transmitter resembling adrenalin by Cannon must be classed with the most important physiological discoveries of the century. More recent have been the postulation of an acetylcholine transmission at the synapses in autonomic ganglia, largely through the work of Dale, and lately the claim has been advanced that at the motor end plate of skeletal muscles an acetylcholine transmission also occurs.²⁻²⁵

Naturally these claims have not met with universal acceptance, and adherents are still to be found to the theory that the spike potential of the nerve ending in the muscle constitutes the stimulus to muscular contraction.²⁶ An examination of material presented on both sides of the controversy reveals that both theories fail to satisfy all the criteria of rigorous proof, of which the following may be mentioned.

Is the theoretical transmitter present at the synapse at the time of transmission? Obviously the spike potential of the nerve ending must be present, although it has of course never been recorded. Acetylcholine can be detected in perfusates, but does not begin to appear for several minutes after stimulation begins. Obviously the perfusion technic cannot provide the essential proof of accurate time relations. It fails to prove that the material recovered actually originates in the synapse, and Lorente de N6²⁷ claims that in fact nonsynaptic tissue gives as much acetylcholine as do synaptic regions. Of course action potentials are also found in synaptic and nonsynaptic regions.

Both acetylcholine and rapid electric shocks—more specifically spike-action potentials—are known to stimulate muscles when properly applied. So, however, do a great many other substances. Potassium ions, which may well play a part in transmission, are particularly excellent stimulators. Evidence that acetylcholine when injected into muscles causes all-or-nothing contractions cannot therefore be considered as more than presumptive evidence, which already exists in equal strength for electrical transmission.

It seems therefore that evidence for chemical transmission can be balanced by equally weighty, yet equally inconclusive, evidence for electrical transmission, and that a decision cannot be made at this time.

Smooth Muscle

Valuable contributions have recently been made to this hitherto neglected field in physiology by the studies of Rosenbluth and collaborators,^{28, 29} by Eccles and a co worker,^{30, 31} and by Fletcher.^{32, 33} Study of their work reveals primarily how little really is known of the physiology of smooth muscle. Save only for the work of McSwiney,³⁴ almost nothing is known of the nature of the sim-

ple muscle twitch of smooth muscle. The identity of the smooth muscle "motor unit" is equally unknown, as are the parts played by contraction of the twitch and tetanus type, and by contracture in producing tension in various smooth muscles. Whether the basic syncytium is of physiological importance and how far it accounts for co-ordination of contraction are subjects only for conjecture. What is more surprising, it is impossible to find agreement concerning the presence of a spike action potential characteristic of propagated disturbance in smooth muscle. The well-recognized presence of a spike potential in active cardiac muscle, and the careful analysis of the potential waves found by Eccles, seem to indicate that at least in the smooth muscle which he studied, the retractor muscle of the nictitating membrane, a spike potential exists. Incidentally, Eccles was able to record long-lasting (200-millisecc.) negative potentials in this muscle following subthreshold volleys via its motor nerve, and demonstrated that during this period summation of a second individually inadequate volley was possible. Much basic work on smooth muscle will probably follow these very stimulating investigations.

THE CENTRAL NERVOUS SYSTEM

Nature of the Central Processes

Few suggestions have been of more value to physiologists than Keith Lucas's³⁷ to the effect that phenomena in the central nervous system are susceptible of explanation in terms of events in simple nerve and muscle. Today, with rival theories of neuromuscular transmission dividing physiologists into opposing camps, the genius of Lucas is more than ever needed to point the path to those who venture into the central nervous system. The evidence which Dale and his collaborators have accumulated in favor of synaptic transmission has been largely concerned with the transneuronal transmission in sympathetic ganglia, in which but a single synapse is involved, but which shows many of the characteristics of transmission within the spinal cord. These workers have carefully avoided any attempts to extend their theory to the central nervous system, in the absence of strict proof. Recently Wright and others³⁸⁻³⁹ have clearly shown that acetylcholine, eserine and adrenalin, all implicated in humoral transmission in peripheral structures, have no less striking effects on reflex activity in the cord. They too, however, emphasize that the evidence they present need only indicate a pharmacologic effect having no necessary relation to the normal physiology of reflex activity. The recent paper of Lorente de N6, calling in question the essential evidence upon which Dale's work is based, serves to emphasize

the very tentative state of all theories at present entertained.

The work of Gasser on the excitability changes following propagated discharges and subliminal stimuli is on the other hand being applied with increasing success to interneuronal transmission. The most profitable application has been the elucidation of the central excitatory state of Sherrington as the period of lowered threshold following a subliminal stimulus, and the central inhibitory state as in all probability a manifestation of the period of increased threshold following a subliminal stimulus. The independent work of Eccles³⁹ and Lorente de N6⁴⁰ indicates that in the central nervous system a distinction between "temporal" and "spatial" summation must be made, as it can be in peripheral nerves. Thus the effects of a simultaneous discharge of several "boutons" or synaptic endings is brought about by a true "spatial" summation of the stimulus produced by each, whether electrical or chemical. Repeated volleys over the same endings must, however, be separated by an interval no less than the absolutely refractory period of the ending, with the result that the voltage of the spike, or the quantum of acetylcholine, has disappeared by the time the second stimulus arrives. In such circumstances the resulting discharge is in reality brought about by the lowering of threshold which invariably follows a subliminal stimulus.

Application of the study of action potentials to the central nervous system presents difficulties identical with those faced by earlier electrocardiographers, amplified many fold: (1) the necessity for indirect leads, (2) a complicated system of action potential production, and (3) the serving of only a small proportion of the cells as a pacemaker, with functional communications on a wide scale. For this reason the analysis of electrical charges in the central nervous system is still incomplete. Those of the spinal cord are naturally more simple but even they present great difficulties. Even so, the presence in cord potentials of the usual spike and afterpotentials are to be recognized, and the association with them of threshold changes is determined.

The analysis of brain potentials by Davis and his collaborators in Boston⁴¹ and by Adrian⁴² in England has served to introduce a subject which still remains in great confusion. The recent authoritative review by Jasper⁴³ should also be consulted.

Central Representation of the Autonomic System

The original hypothesis as proposed by Bichat to account for the activity of the autonomic nervous system attributed to that system complete independ-

ence of the central nervous system, and located the source of spontaneous activity and the center for reflex behavior in the peripherally situated ganglia. While some modern work, notably that of Schwartz,⁴⁴ suggests that reflexes may possibly take place in ganglia isolated from the central nervous system, the bulk of evidence suggests most strongly that representation of the autonomic system is to be found side by side with that of the skeletal nervous system at each level of integration. Spinal autonomic reflexes have in fact been reported, and the decerebrate animal possesses many notable autonomic reflexes. Further representation in the hypothalamus has been recognized for a number of years, and Ranson's⁴⁵ Harvey Lecture for 1937 summarizes this subject from the viewpoint of one of its most active students.

It is no less certain that the autonomic system is well provided with cortical representation. The recent review by Fulton⁴⁶ indicates that cortical representation had in fact been suspected by a great number of the best neurologists of the nineteenth century, but the experiments which they carried out failed to meet all the criteria of rigorous proof. Within the past few months definite, unequivocal evidence of cortical representation has been provided by the work of E. C. Hoff and Green.^{47, 48} Rigorously excluding changes produced by spread of current and due to reflexes originating in the movements of skeletal muscle, these investigators were able to demonstrate the presence of sharply circumscribed areas whose stimulation produced changes in blood pressure, heart rate and capacity of the vascular bed in the kidney and leg. Both the motor and premotor areas contained motor point, and very closely located spots often gave diametrically opposed results. Rioch and his co-workers⁴⁹ and Schwartz⁵⁰ furnish corroborative evidence. Further evidence of the close functional interrelation between the centers of autonomic and skeletal reflexes is provided by the observations of Dusser de Barenne and Ward,⁵¹ Schweitzer and Wright,⁵² and Barclay and Franklin,⁵³ who independently demonstrated the effect of somatic reflexes of afferent stimulation normally associated with autonomic reflexes. The postural changes associated with micturition in animals are of course obvious examples of this close interaction.

THE CARDIOVASCULAR SYSTEM

Intraventricular Conduction

For years the classic description by Lewis of the spread of the cardiac impulse through the ventricles has taught that the impulse is propagated at a rapid rate in the bundle of His and Purkinje fibers to the endocardial surface of the ventricles,

where a transition to muscle fibers takes place and a much slower conduction outward to the epicardial surface occurs.

Objections to this hypothesis were first raised by Robb⁵⁴ in her careful anatomical studies of the distinct muscle bundles of which the heart is composed. She suggested that just as each bundle has its own blood supply, and suffers as a unit from obstruction to that supply, so also it is activated by its own Purkinje supply. The spread of the cardiac impulse must therefore be considered to consist of a rapid spread along the Purkinje system to a muscle bundle, and from there along the bundle by direct conduction along muscle fibers, as in the auricle, at a rate not much less than that in the Purkinje system.

Somewhat later, several workers found unmistakable proof that the Purkinje system extended beyond the subendocardial network, throughout the entire myocardium.^{55, 56} This extension of the Purkinje system, which in fact had not entirely escaped the notice of earlier histologists, provided the incentive to a renewed study of the spread of the impulse through the ventricle, with the use of more adequate recording systems, and avoidance of cooling and drying of the surface of the heart. These studies^{57, 58} have shown fairly conclusively that the impulse does arrive first at the septum, and the region of the ventricular walls near the septum, as demonstrated by Lewis. It is obvious also that the entire heart, both internally and externally, is then activated very rapidly, and that no differences can be found between the inside and outside. Finally, no evidence can be found to support Robb's suggestion that the process of excitation follows muscle bundles. It can thus be concluded that the intramuscular Purkinje network acts to distribute the cardiac impulse, with great rapidity, to all parts of the myocardium, rather than to the endocardial surface of the ventricles, as was formerly believed.

The Blood Supply of the Myocardium

A second fundamental contribution to the knowledge of the heart is recognized in the studies of Wiggers and his associates on the blood supply of the myocardium. Recent anatomical investigations, well reviewed by Wearn in Levy's *Diseases of the Coronary Arteries and Cardiac Pain*,⁵⁹ have indicated that blood entering the coronary arterioles may take widely differing courses to the right ventricle. Some, of course, may pass into capillaries and thence by way of the venules into the coronary sinus and right auricle. The well-known Thebesian channels may divert some blood from the capillaries and venules directly into the right ven-

tricle. It is now recognized that accessory passages, the arteriosinuosidal and arteriololuminal vessels, also exist between the arterioles and the ventricular chambers

Some of the physiological implications of these facts have been recognized for many years, and while it is known that under certain conditions approximately 70 per cent of the coronary flow returns through the coronary sinus, physiologists have found that the actual proportions may vary widely. In fibrillating hearts especially, the Thebesian outflow was found to predominate. This led to the supposition, now carefully worked out by Johnson and Wiggers,⁶⁰ that right ventricular pressure is a major factor in diverting blood from the Thebesian channels to the coronary sinus. Johnson and Wiggers now report the following important conclusions: (1) the coronary sinus normally empties into the right atrium only during systole, (2) increasing the right ventricular pressure causes a proportional increase in coronary sinus outflow, all other factors remaining constant, and (3) the increase in coronary sinus outflow produced by certain drugs and by stimulation of cardiac nerves may well be the result of slight elevation of right ventricular pressure. It is more than ever obvious, therefore, that the measurement of coronary sinus outflow, taken by itself, cannot be used as a method for estimating the amount of coronary circulation or the variations it may undergo.

To the question of how coronary flow may be measured, Johnson and Wiggers⁶⁰ have devoted great perseverance and the most exquisite techniques. The present studies, well reviewed in the chapter on coronary flow written by Wiggers for Levy's *Diseases of the Coronary Arteries and Cardiac Pain*,⁵⁹ are based principally upon the determination of the velocity of blood flow by the method of Pitot's tubes, in which the velocity is calculated from the differential pressure between two tubes inserted into a vessel, one directed against and one with the circulation. The most interesting outcome of this method to date is the confirmation of the finding of Anrep that the flow of blood may slow or even stop momentarily during the brief isometric phase of systole, coupled with the demonstration that despite this momentary stoppage, as much or more blood may flow out of the coronaries during systole as during diastole.⁶¹

The Action Potentials of the Myocardium

The identification of the multiple phases of the monophasic action potential in nerve fibers carries with it the important implication of application to other tissue producing action potentials.

Of all such tissues perhaps the heart is most interesting, and presents the most difficulties. Much remains to be learned: the nature of the monophasic action potential has become the subject of renewed study,^{62 63 64} and the manner in which local potentials summate to produce the electrocardiogram as derived from external leads continues to be debated.^{62 64 65}

Especially interesting have been the successful attempts of Rothberger and Goldenberg⁶⁶⁻⁷⁰ to register monophasic action potentials from isolated strips of Purkinje fibers. These strips, which beat rhythmically, show a monophasic action potential of at least two phases, a spike and a negative afterpotential. Slow changes from positivity to negativity are occasionally detected immediately before the spike of spontaneous discharges.

Simultaneous mechanograms prove definitely that the electrogram does not terminate with the end of mechanical events, but persists for some time after, and varies independently of mechanical events under the influence of a variety of conditions. This suggests that the association of the end of the T wave in the electrocardiogram with the end of systole is neither exact nor of any significance.

These studies have offered a new approach to a problem that has long agitated physiologists: the origin of the so-called "ectopic" arrhythmias, including extrasystoles and tachycardias from both auricles and ventricles. There has been a growing tendency to consider these as the result of "re-entrant excitation" from a wave traveling continually in a circle in the cardiac tissue. While this hypothesis successfully accounts for auricular flutter and fibrillation, its extension to the extrasystolic arrhythmias has been vigorously opposed by those who favor the hypothesis that these irregularities are brought about by the development of an ectopic pacemaker, which gives rise to a single beat, a short burst of tachycardia, or a long run of tachycardia, depending upon the degree to which its rhythmicity surpasses that of the normal pacemaker and the persistence of this change.

In favor of circus movement has hitherto been the phenomenon of "coupled beats" or "bigeminy," in which an extrasystole alternates with a normal beat. It was noticed that the extrasystole was in some way coupled with the preceding beat, if the rhythm of the normal beat was altered, that of the extrasystole likewise changed, and to the same degree. It was thought that the normal beat set up a circus movement in the heart, which after traversing some undesignated pathway emerged to stimulate the heart and provoke the premature beat.

The Viennese workers finding that isolated strips

of Purkinje fibers produced action potentials having many of the characteristics of nerve fibers, recalled that the work of Gasser and Erlanger had solved the mechanism of a phenomenon discovered long before by Wedensky. As mentioned before, this worker had noticed that a frog's motor nerve, on being stimulated tetanically at a sub-threshold level, responded to a single effective shock, not by a single twitch but by a tetanus, which persisted as long as the previously sub-threshold stimulus was maintained. It became obvious that the preparation must have been one showing a marked supernormal phase after recovery from the refractory period of the single shock. During this period the previously ineffective tetanic stimulation evoked a response, likewise followed by a supernormal phase, and so on. It was then found that in isolated Purkinje strips the coupled beat occurred just at the height of the supernormal period following the first beat. This work suggests that just as a marked supernormal period in the nerve is found to favor the appearance of tetanic discharge, so also in the heart a supernormal period forms the basis for the development of ectopic arrhythmias of all types. Certainly these observations convert a cogent reason for believing in the circus movement into very much more valid evidence for the ectopic pacemaker theory. While the importance of these experiments and the inferences to be drawn from them are obvious, the presence of supernormality in the intact mammalian heart remains to be adequately explored. Only then can the significance of the present studies be determined with accuracy.

Physiology of the Veins

Study of the physiology of the veins has received renewed impetus in the publication of Franklin's¹ *Monograph on Veins*. The volume reflects not only the important contributions he has made to the subject through a series of investigations extending over many years, but also a deep interest in the history of the circulation, so well manifested in his translation of Lower's *Treatise on the Heart*. Another individual contribution worthy of note is the demonstration by Nonidez² of the presence of receptor organs in the intrapericardial parts of the great veins. Both the venae cavae as well as the pulmonary veins are shown to be richly supplied with subendothelial endings greatly resembling the pressor-receptors in the carotid sinus, the aorta and the right subclavian artery. Endings of a different type were found around the muscle fibers in the walls of the pulmonary veins and superior vena cava. The first were assumed to be the receptor organs for the reflex first described by Bainbridge, who found that increase in the pressure within the right auricle evoked a reflex ac-

celeration of the heart. No function has been ascribed to the perimuscular terminations.

RESPIRATION AND METABOLISM

Nervous Control of Respiration

The role of the carotid body in the regulation of respiration was anticipated many years ago by Siciliano,³ who occluded the great arteries of the neck and observed both changes in blood pressure and alterations in rate and depth of breathing. He clearly stated his belief that the region of the common carotid near the bifurcation might prove to be an important point of origin for reflexes regulating the blood pressure and respiration. It is only recently, largely through the work of Heymans, that the carotid body has been recognized as a center specifically stimulated by anoxia. The most recent development in this field has been the discovery that certain drugs act to stimulate respiration by virtue of a local action on the carotid body.⁴⁻⁶

The location of the "respiratory center" has interested physiologists ever since Legallois found that damage to the medulla was followed by arrest of respiration. Since then attempts to delimit more exactly the areas involved have employed such methods as local warming and cooling,⁷ application of drugs to discrete areas and the production of small, circumscribed injuries. All these methods have failed to indicate that any specific group of cells in the medulla is the pacemaker of the respiratory center. More recently the method has been introduced of obtaining action potentials through small electrodes inserted into various parts of the medulla.⁷⁻⁹ These have shown that cells in a number of the nuclei of the medulla discharge rhythmically in synchrony with discharge of the motor neurons of the respiratory muscles, and that to none of them can as yet be ascribed the function of pacemaker. Just as the precise location of the pacemaker of the heart depended upon the determination of the point of primary negativity, so it would seem that the position of the respiratory pacemaker depends upon the exact timing of the moment of discharge of one group of cells as compared with the others.

The Intimate Nature of Cell Respiration

Recent years have seen the development of a new approach to the problem of the intimate nature of cell and tissue respiration, namely the development of instantaneous methods of assaying changes in the interior by color or spectroscopic changes. The determination by Keilin in 1925 of the time of reduction of cytochrome is observed visually in a spectroscope was followed by the use of photoelectric cells for study of similar activity in yeast

by Haas in 1934. Optical changes in contracting muscle were recorded photoelectrically by von Muralt in 1934. Last year Millikan⁵⁰ reported the measurement of the reduction of muscle hemoglobin in intact muscles, using a photoelectric cell to pick up changes in color of the muscle illuminated transversely. The system was made stable to a variety of possible variants such as thickness of muscle, amount of contained blood and the changes in opacity noted by von Muralt, by utilizing only the change in transmissibility of green and red light brought about by reducing or oxidizing muscle hemoglobin. Millikan concludes from these experiments (1) muscle hemoglobin acts as a short-time oxygen store to tide the muscle over from one contraction to the next, (2) when contraction takes place the oxygen demand starts to rise in less than 0.2 seconds, reaches its maximum value within 1 second, and falls nearly to its resting value within 10 seconds of the end of the contraction, (3) blood flow through the soleus muscle of a cat appears not to be greatly affected by maximal tetanic contraction, whether the muscle is stimulated directly or by its nerve.

It is too early to attempt to fit information such as this into the general picture of muscle chemistry. It is essential to point out, however, that the accuracy of the time values obtained by such methods is conditioned by the nature of the recording system. The galvanometer used by Millikan to register the changes in current produced by the photoelectric cell was stated to have a period of about one second, a figure out of all proportion to the time relations that undoubtedly occur. This problem has been considered in a second series of experiments designed to answer the question of whether enzymes enter into chemical combination with the substrate.⁵¹⁻⁵⁴ Stern⁵¹ had previously shown that when monethyl hydrogen peroxide was added to a concentrated, highly active solution of liver catalase, the spectrum of the free enzyme disappeared and was replaced by two new absorption bands. Much later the new bands faded and the old spectrum reappeared. To measure the rate of the first reaction between enzyme and substrate, Stern and DuBois⁵² devised an apparatus in which monochromatic light of the same wavelength as the absorption bands to be studied penetrated a cell containing the reaction mixture and struck the cathode of a photoelectric cell. The photoelectric current was amplified and recorded through a string galvanometer. It was found that, while mixing was complete in 0.04 to 0.06 seconds, the time for half completion of the enzyme-substrate reaction varied from 0.06 to 0.26 seconds.

To check the accuracy of these methods, in which

both the photoelectric cell and the string galvanometer interposed definite time limitations, these investigators devised a direct method whereby the reaction cell was placed between the light source and the slit of the spectrograph, which was equipped with a falling-plate camera, so that continuous pictures could be obtained of the changes in the spectrum.⁵³ This method demonstrated first that mixing of the reagents was completed as quickly as 0.006 seconds, and that the enzyme-substrate reaction was completed before mixing was over.

While such promising studies are carried on, study of similar problems by the classic chemical procedures have continued to progress. Some of these have been admirably summarized in a volume of essays entitled *Perspectives in Biochemistry*,⁵⁵ published in honor of Sir Frederick Gowland Hopkins on his seventy-fifth birthday. Particularly interesting are the reviews by Needham of the chemical cycles in muscle contraction, and of Szent-Györgyi on his own work on the catalytic action of the four-carbon-atom dicarboxylic acids in cell respiration. His discovery of the function of these acids as a link between the foodstuff and the Warburg-Keilin oxidative enzymes is equivalent in interest to his demonstration that the stages in fermentation involving trioses were followed almost exactly by the four-carbon acids, which were in reality trioses stabilized by the addition of a terminal carboxyl group.

THE ENDOCRINE GLANDS

Glands Regulating Carbohydrate Metabolism

In 1936 this journal published an account of one of the most fruitful advances in endocrinology since the discovery of insulin.⁵⁶⁻⁵⁷ In his Dunham Lectureship Series, delivered at the Harvard Medical School in 1935, Houssay described a long series of experiments in his laboratory which showed unmistakably the intimate association between the secretion of the anterior lobe of the pituitary gland and the regulation of carbohydrate metabolism. His evidence consisted of three main points: (1) the great hypersensitivity of hypophysectomized animals to the injection of insulin, and their equally striking lack of sensitivity to the injection of adrenalin, (2) the improvement in the condition of depancreatized animals effected by removal of the hypophysis, and (3) the production of persistent diabetic-like states by the injection of anterior pituitary preparations.

These experiments, amply confirmed, made necessary a revision on a wide scale of previous notions concerning the mechanism involved in production of diabetes mellitus in man. It could no

longer be held that this disease was invariably of pancreatic origin, and that varying degrees of insulin deficiency resulted in varying degrees of impairment of the ability of the tissues to utilize glucose, terminating ultimately in total inability to oxidize it. It also became obvious that processes might exist under hormonal control that result in glucose production from noncarbohydrate sources, and that other hormones might act to increase or decrease carbohydrate utilization.

Recently the role of other endocrines in regulating carbohydrate metabolism has been extended through the work of Long and his colleagues.⁸⁰⁻⁸³ Removal of the adrenal cortex in cats, and maintenance of the animal over long periods by administration of potent preparations of cortin, permitted Long to ascertain (1) that adrenalectomy improves the total pancreatic diabetes to the same degree as does hypophysectomy, and causes a prompt disappearance of glycosuria in partially depancreatized rats, (2) that injections of extracts of the anterior pituitary fail to produce glycosuria in adrenalectomized rats, and (3) that the adrenalectomized rat shows a sensitivity to insulin due to cortical loss as well as the medullary deficit.⁸⁰ The only failure in the almost exact parallel between the removal of the adrenal cortex and the anterior pituitary is that cortical extracts which are potent so far as water and salt metabolism are concerned fail to restore glycosuria in a depancreatized, adrenalectomized animal to the degree that anterior pituitary extracts prove effective in hypophysectomized, depancreatized animals. However, enough evidence has been accumulated to indicate that the adrenal cortex plays an important part in sugar metabolism, both in normal and in diseased subjects.

The Sex Hormones and Growth-Promoting Agents

The appearance in 1937 of a second edition of Fieser's⁸¹ *The Chemistry of Natural Products Related to Phenanthrene*, a year after its first publication, indicates the enormous interest in these compounds. Elucidation of close relation between compounds which produce cancer and the internal secretions of the sex glands is of the greatest interest both to physiologists and to physicians. The retardation of the growth of certain tumors brought about by suppression of ovarian secretion has been known to clinicians for some time, and Allen⁸²⁻⁸⁵ is largely responsible for the demonstration that injection of follicular hormone in male or female mice will produce mammary cancer in susceptible strains. What is more interesting, cancer has at times been produced in regions other than in the mammary gland, where it is usually observed. The discovery of the chemical similarities between the cancer-producing substances and

the sex hormones places these studies upon a rational basis, and forms the starting point for future work on the physiology of normal and abnormal growth.

One of the most recent developments in this field is the study of the effect on cell growth of the well-known substance of this group, colchicine.⁸⁶ This drug, recognized for a great many years as a sovereign remedy for the gout, is now found by Lats to have a marked inhibitory effect on cell division in animals when injected in certain concentrations. What is more surprising, it seems to have its specific effect only at the metaphase stage of cell division. It becomes therefore a new and valuable method for studying rate of growth in a variety of conditions, since cells accumulate in metaphase from the time of injection to the time of sacrifice. Whether the growth-arresting property of colchicine has any relation to its effect in gout is at present a matter only for conjecture.

A noteworthy study in another field of endocrinology is that by Gilman and Goodman.⁸⁷ They have been able to detect the presence in the urine of the pituitary antidiuretic hormone, and to demonstrate that it is secreted in response to a demand for water conservation.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24231

PRESENTATION OF CASE

First admission A thirteen-year-old, native-born, white boy entered the hospital with the complaint of lameness of two years' duration.

Seven years before entry he developed polydipsia, frequency and severe enuresis. He was admitted to another hospital two years later, where physical examination revealed slight enlargement of the heart and a blood pressure of 120 systolic, 85 diastolic. At that time his phenolsulfonphthalein test of renal excretion gave 10 per cent in the first hour and a total of 20 per cent in two hours. The nonprotein nitrogen of the blood was 75 mg per cent. An Addis determination of urine content showed a specific gravity of 1.012, a trace of albumin, 1,350,000 casts (upper limit of normal 10,000) and 500,000 red cells (upper limit of normal 600,000). After forcing fluids for ten days the nonprotein nitrogen was 26 mg per cent. About that time his physical development began to slow down, and during the two years before entry his height remained stationary. During the year after his entry to the other hospital there was no great change in his condition. His blood pressure remained below 108 systolic, 70 diastolic. The urine showed rare red-blood cells and granular casts, and on one occasion the nonprotein nitrogen of the blood was 56 mg per cent. Three years before entry to this hospital he had a mild attack of scarlet fever, and after a month of convalescence in bed began to have difficulty in walking and supporting his weight. There was associated dyspnea on exertion and easy fatigue. He also complained of pain in the lower lateral chest, bilaterally, which was aggravated by laughing or sneezing. His physical disabilities gradually progressed, until he was almost unable to climb stairs without support, and he began to use a walking stick. He was taken out of school from the fourth grade which he had had to repeat because of poor reading ability. At no time did his muscles appear to be larger than normal but rather appeared to decrease in size as his weakness progressed. He never had an exaggerated lordosis, but he developed a waddling gait and a bilateral valgus deformity of the knees. Two years before entry he had an attack of cramps in both hands and feet lasting

half an hour, with recurrence of the foot cramps at monthly intervals for three to four months. Occasionally his hips were sore, and shortly before entry he complained of painful stiffness in the joints of his little fingers. About nine months before entry his skin became coarse and dry, and his hair became thinner. He was seen in the outpatient department at that time, and a neurological examination revealed no significant findings except muscular atrophy and weakness with diminished to absent tendon reflexes. There was no characteristic distribution of weakness, and he was considered to present a problem of general deferred growth. His urine had a specific gravity of 1.004 and contained a slight trace of albumin, and the test for sugar gave a green reaction with sediment.

For many years he had had frequent sore throats until his tonsils and adenoids were removed five years before entry, which was two years after the onset of his illness. He had had whooping cough at the age of five, chickenpox at nine and measles at ten, shortly after his attack of scarlet fever. His physical and mental development had appeared to be normal up to the onset of his illness. He had had no visual symptoms, epistaxis, orthopnea, jaundice, melena, hematemesis, hematuria, dysuria, edema, puffiness of the face or any neurological symptoms, such as twitching or convulsions. His family history was negative except that his maternal grandmother had mild diabetes.

Physical examination revealed an undernourished, underdeveloped boy. The skin was dry and coarse, and there was generalized muscular atrophy and weakness. The tendon reflexes were increased in activity, but neither a Chvostek nor Trousseau sign was present. A forceful apex heart beat was felt in the fourth interspace, 6 cm from the midsternal line. The heart sounds were of good quality, and no murmurs were heard. The blood pressure was 120 systolic, 88 diastolic.

The temperature was 100°F, the pulse 128. The respirations were 28.

The urine was acid, had a specific gravity of 1.004 and contained the slightest possible trace of albumin, no sugar, 1+ acetone, many coarse granular casts and occasional red cells and white cells. The urine concentration test gave a maximum specific gravity of 1.006. The blood showed a red-cell count of 3,200,000 with 75 per cent hemoglobin, and a white-cell count of 9000 with 76 per cent polymorphonuclears. A phenolsulfonphthalein test of renal function gave 2 per cent excretion in two hours. The nonprotein nitrogen of the blood was 67 mg, the sugar 59 mg, the calcium 7.45 mg, the phosphorus 6.76 mg and cholesterol 187 mg per cent. The carbon-dioxide combining

power was 29.3 vol per cent, and the blood chlorides were equivalent to 100 cc of N/10 sodium chloride. The basal metabolism rate varied from $+7$ to $+18$ per cent. An electrocardiogram showed a tendency to left-axis deviation and low T waves.

X-rays of the bones showed generalized decalcification with widening of the growing epiphyseal lines and some irregularity of the metaphyses. In the upper ends of both fibulas, and in at least three metatarsal bones there were thin fracture lines with some increased density about them, so-called *Umbau-zone*. The sella turcica appeared normal and the skull was normal in size and shape. Dental films showed absence of the lamina dura in most of the teeth, and retardation of dental development. The chest x-ray was negative, and flat films of the abdomen, though somewhat unsatisfactory, showed no gross calculi or other abnormalities.

He was given a high-carbohydrate, high-vitamin and low protein diet, with calcium lactate and sodium gluconate. His fluid intake and output were very high, and he used a good deal of table salt with his meals. On the eighth day the nonprotein nitrogen of the blood was 62 mg., the calcium 817 mg and the phosphorus 404 mg per cent. The phosphatase was 1276 Bodansky units. The chlorides were equivalent to 94 cc of N/10 sodium chloride. The carbon-dioxide combining power was 56.9 vol. per cent. Eight days later a retrograde pyelogram showed a normal left ureter and kidney pelvis, and no evidence of calcification in either kidney. He was discharged on the eighteenth day essentially unimproved.

Final admission (eight months later) He was followed in the Out Patient Department. Two months after discharge his blood pressure was 118 systolic, 80 diastolic, and he was doing fairly well. Four months before entry the nonprotein nitrogen of his blood was 65 mg., the calcium 6.92 mg., the phosphorus 4.06 mg., the uric acid 5.7 mg and the sugar 130 mg per cent. The carbon-dioxide combining power was 25.8 vol per cent, and the chlorides were equivalent to 94 cc of N/10 sodium chloride. His appetite gradually became worse, and he lost a little weight. Four days before re-entry he began to vomit and continued to vomit all food and fluids taken.

Physical examination revealed an emaciated, lethargic boy showing marked evidence of dehydration. Otherwise the physical examination was essentially the same as before. The heart was apparently not enlarged, and the blood pressure was 118 systolic, 74 diastolic.

The temperature was 98.6°F, the pulse 96. The respirations were 24.

The urine had a specific gravity of 1.005 but was reported otherwise negative. The blood showed a red-cell count of 4,500,000 with 60 per cent hemoglobin, and a white-cell count of 29,000 with 91 per cent polymorphonuclears. The nonprotein nitrogen of the blood was 102 mg per cent and the carbon-dioxide combining power was 19.9 vol per cent.

He died on the day of entry.

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES The most striking finding is the decalcification shown in all bones examined, with a widening of the epiphyses which is characteristic of rickets. This is the bilateral line of diminished density with increased density around it, which was interpreted as fracture. It seems to me rather odd that it should be so symmetrical. I wonder if it is anything else. If it is not fracture, I do not know what it is. In the examination of the urinary tract the kidney outlines are rather faintly visible and seem to be quite small for a child of that size. I do not suppose one is justified from the x-ray examination alone in saying definitely what size the kidneys are, but one can sometimes make an intelligent guess as to whether they are large or small, and in this instance they appear to be small. There is no evidence of calcification in the kidneys. In the chest we see the same decalcification of the bony thorax that we see in other places, and a rather high diaphragm. In the lung fields the markings are quite prominent. The heart is perhaps a little enlarged to the left, but might not be abnormal. I should be inclined to think that Dr. Mallory would find that the heart weight was normal. There are no mediastinal masses—nothing in the chest to account for the dyspnea.

Then in the skull the anterior sutures are closed, which is unusual for a child of this age and may mean early closure, the posterior sutures are quite indistinct. In the teeth there is some retardation of growth and change in the periodontal membrane. I should not be certain that it is absent. It is a definite sign. I am sure it is found in parathyroid disease, but I am not certain that it is not sometimes found in other conditions. My feeling in this case is toward renal rickets rather than parathyroid disease.

DR. HAROLD L. HIGGINS What is his age from the epiphyses?

DR. HOLMES I cannot tell accurately enough.

to allow me to decide whether there is late development

DIFFERENTIAL DIAGNOSIS

DR ALFRED KRANES This is a very interesting and unusual story, and I think there can be very little doubt that we are dealing with a patient who had renal rickets. The clinical story should be discussed in two phases (1) the renal disease and (2) the skeletal disease—each one of which might better be considered independently.

The story is unusual because this patient came under observation two years after the onset of his first renal symptoms, and at that time the first accurate observations that were made showed that he did have a moderately severe degree of renal impairment with an elevated nonprotein nitrogen in the blood and a low specific gravity of the urine. Nevertheless, he managed to live for five additional years—a rather unusual survival period after renal insufficiency manifests itself.

It is always more or less of a guess as to what the renal lesion will be when presented with a case of nephritis. In this patient we are simply given a problem in renal insufficiency. We have absolutely no data on which to predict what type of lesion will be found. We have to rely mainly on probabilities. With the disease beginning at his age one has to think of congenital lesions of the urinary tract, the two most common of which are congenital hydronephrosis—for which there seems to be no evidence in the retrograde pyelogram—and polycystic kidneys—for which we also have no evidence, no abdominal masses having been palpated and the pyelogram showing no enlargement of the kidneys. Both these diagnoses seem rather unlikely. Another type of chronic renal disease in children which may lead to renal insufficiency is chronic pyelonephritis. However, there are no signs of infection, no pyuria has ever been found, and there are no chills or fever, except for one isolated temperature of 100°F. With as little evidence as is present here one can safely exclude chronic pyelonephritis.

We are left, then, with the diagnosis of chronic glomerulonephritis first, by exclusion and, secondly, because statistically it is the most common lesion at this age. This boy was not seen at the onset of his disease—at least no observations are recorded on him then—so that we do not know whether hematuria was present at the onset. It is frequently overlooked at the beginning of the acute nephritis, at least in the history. However, when he was observed two years later, at which time renal failure was present, hematuria was not found. In addition, his kidneys, as Dr Holmes

would lead me to believe that he did have a very small, contracted pair of kidneys, the result of chronic glomerulonephritis, and that the patient died in uremia.

There is one other possibility, in view of the bone disease, which we have to mention and consider seriously that is hyperparathyroidism, which will cause chronic renal disease and will also produce the changes that have been described in the skeleton. He had a very high blood phosphatase, although the remainder of the blood chemistry is atypical for hyperparathyroidism. We must remember, however, that the presence of severe renal impairment might mask the characteristic blood findings of hyperparathyroidism, particularly the phosphorus level. I think it is very unlikely that this patient had primary hyperparathyroidism. In the first place the statement is definitely made that there was no calcification in the kidneys, and the renal insufficiency of primary hyperparathyroidism is produced by a process called nephrocalcinosis, or deposits of calcium in the renal tubules which frequently show up by x-ray. Secondly, we have evidence that the renal disease started long before the bone disease, which is quite the reverse of hyperparathyroidism. One would have to have long-standing parathyroid hyperplasia to produce chronic renal insufficiency. Nevertheless, I do believe that this patient's parathyroid glands will very probably be enlarged, not because of but rather the result of prolonged renal insufficiency. We know that in chronic nephritis there frequently is enlargement of the parathyroid glands, and this patient with a renal insufficiency of at least five years' duration, and probably more, ought to have a good deal of enlargement.

We might speculate as to the cause of that enlargement. If one believes, and there is considerable reason for doing so, that one of the primary functions of the parathyroid hormone is to lower the renal threshold for phosphorus excretion, we can then explain the parathyroid hyperplasia as the result of phosphorus retention. The parathyroids become hyperplastic in an effort to reduce the phosphorus concentration of the blood. That such a mechanism was operating here seems likely, because, although this patient had a severe degree of renal damage, the phosphorus content of the blood was only slightly over 4 mg. That I think would be quite unusual in the absence of parathyroid hyperplasia. It ought to be 6, 7 or perhaps 8 mg per cent. Dr Albright and Dr Drake did some interesting experiments here several years ago on the production of parathyroid hyperplasia by the parenteral injection of phosphates into rabbits. They found that by keeping the blood phosphorus

constantly elevated they were able to produce parathyroid hyperplasia. Similarly in this case, if parathyroid enlargement is found, it will probably be secondary to the renal disease and phosphorus retention.

As regards his bone disease which has been described as renal rickets, — undoubtedly a poor term, — the bone changes that these patients have are not really those of rickets. Histologically they are osteitis fibrosa cystica — the same as in hyperparathyroidism, but the term "rickets" has been used for so long that it seems to be here to stay.

What the skeletal changes are due to, is again a matter of great controversy. There are three possible explanations for them, but which one is responsible, or whether all three are, has not yet been settled. The most obvious explanation — that the parathyroid enlargement and hyperplasia produce the skeletal abnormalities — has not found any experimental support. Several years ago a case similar to this in an adult was studied on the wards here, and it was found that the renal excretion of calcium, which in real hyperparathyroidism is much increased, was only slightly elevated. If the parathyroids were responsible for the skeletal changes, one would expect a marked increase of urinary calcium. However, in the case that was studied here, the urinary-calcium excretion was relatively normal. Even with damaged kidneys one would expect fairly good excretion of calcium.

The second explanation might lie in the chronic acidosis that these people have. We know this boy had an acidosis for at least eight or nine months, and the probabilities are that he had chronic acidosis all during the period of renal failure. Any long-standing acidosis will produce a picture in the bones which cannot be differentiated from osteitis fibrosa cystica. Bodansky and Jaffe were able to produce the typical picture of osteitis fibrosa cystica in dogs by prolonged administration of ammonium chloride. We have here the probable explanation of the skeletal changes.

A final explanation is the increased phosphorus excretion in the intestinal tract, which results in the precipitation of calcium phosphate. The ingested calcium is therefore not absorbed since it becomes insoluble, and as a result these individuals live on what amounts to a diet markedly deficient in calcium. Which one of these three above-mentioned possibilities is responsible has not definitely been settled, but the most probable is the chronic acidosis theory.

In summary, I should say that this patient had, primarily, a chronic glomerulonephritis, with a small, contracted pair of kidneys, and that he died in uremia. Secondary to the nephritis and phos-

phorus retention he developed parathyroid hyperplasia, and along with this, because of the prolonged acidosis, he developed the bone picture of osteitis fibrosa cystica. In addition, because of the prolonged course of his renal disease, I think it is quite probable that he had a rather marked degree of generalized arteriosclerosis.

DR. TRACY B. MALLORY: There is one point not particularly emphasized in the summary that would have been obvious if you had seen the child — his dwarfism. His growth was quite markedly retarded. He was short and much underweight as well. Does that in any way alter your feeling?

DR. KRANES: I think that prolonged renal insufficiency could produce the dwarfism by the same mechanism that the bone changes are produced.

DR. HAROLD L. HIGGINS: I think the cramps could quite well have been due to tetany, as his blood calcium was down to 7.5 mg per cent most of the time. The boy was 48 in. tall, which is the height of a boy about eight years old. As he was thirteen years and two months old, he was five years behind schedule so far as height was concerned. But his head measured 21 in., which is the average size for an eight-year-old child. He seemed to be a proportional dwarf and not simply a dwarf because of short extremities. The appearance of the skin, which was rather smooth, and the very scanty hair somewhat suggested a pituitary midget, but the general condition of the child was that which we frequently see in children who develop kidney insufficiency. They stop growing and develop what is known as renal rickets, which really is not rickets at all, although it probably is caused by the renal condition.

CLINICAL DIAGNOSES

Uremia
Chronic glomerulonephritis

DR. KRANES'S DIAGNOSES

Chronic glomerulonephritis
Renal osteitis fibrosa cystica
Parathyroid hyperplasia
Uremia

ANATOMICAL DIAGNOSES

Chronic nephritis
Healed pyelonephritis?
Cardiac hypertrophy, slight.
Pericarditis, chronic fibrous
Osteitis fibrosa, slight
Parathyroid hyperplasia, very slight.
Basophilism of the pituitary

PATHOLOGICAL DISCUSSION

DR. MALLORY The relation of renal insufficiency to osteitis fibrosa seems to be very well established, but what relation there is between renal insufficiency and dwarfism is still a very open question. I spent a good deal of time trying to find some information about it in the literature and must admit I had very little luck. We have seen here one case with marked so-called renal rickets, that is, marked fibrotic and cystic changes in the bone, without dwarfism. This case today is somewhat over on the other side. It showed a marked grade of dwarfism and changes in the bone that one can recognize as similar to osteitis fibrosa, but they were very early. Quite to our surprise, the parathyroids were not large. We had fully expected that we would find very big ones, as Dr. Kranes predicted. We were only able to identify three. When all the parathyroids cannot be found it is quite certain that they must be small. Those we did find were barely larger than normal and only with the microscope could one be sure there was some hyperplasia. Similarly, the changes in the bones, though present, looked as if they were of comparatively short duration. So this case on the whole supports the theory of the bone changes' being secondary to acidosis. At least we know that acidosis was present for a considerable period of time. The thyroid and adrenals were perfectly normal. The kidneys were shrunken, and distinctly smaller than normal. At autopsy we thought the ureters were slightly dilated. Their diameter was estimated at 5 mm. which would be large for a child of that age. The largest proportion of cases of renal rickets reported have been in association with congenital dilatation of the ureters. I believe we must add this case to the list, though the anomaly was present only in a very slight degree. It would be rash to try to state dogmatically the exact nature of the renal lesion. It was an end stage of a very chronic process with no evidence of progressive damage at the time of autopsy. There were quite a significant number of perfectly normal glomeruli which would be a little surprising if it were the end stage of glomerulonephritis. Certainly no active glomerulitis was present. The tubules, in contrast, were reduced in numbers out of proportion to the destruction of glomeruli, and the degree of interstitial fibrosis was quite marked. The pelvises were not dilated, and sections which included the pelvis showed no signs of inflammation. Certainly there was no pyelonephritis at the time of death. I can conceive of a kidney such as this being the end result of a completely healed pyelonephritis or of interstitial nephritis of the type occasionally seen with

scarlet fever, but cannot rule out with certainty a completely burned-out glomerulonephritis.

DR. KRANES What about the arteries?

DR. MALLORY They did not show any great amount of atheromatosis. The heart weighed 175 gm., which would probably be within the normal limits for a boy of thirteen if he were of normal size, but seemed hypertrophic in proportion to the general development.

I found the pituitary very interesting. It was of normal size, but the sections show unusual proportions of the three types of cells. Chromophobes, which normally make up two thirds of the total, were greatly reduced—to about 20 per cent I should guess. Acidophils were relatively and perhaps absolutely increased in number and basophils were unquestionably greatly increased in number, both absolutely and relatively. I should estimate them at nearly 25 per cent of the total. Of course not too much emphasis should be placed on estimates unsupported by an actual count, but the decrease in chromophobes and the increase in basophils are so marked in this case that there can be no doubt that the ratios are very abnormal. In comparison with an adult pituitary these changes are certainly significant. I must confess to knowing little about the child's pituitary, but in view of Parsons's* findings I think we may assume the changes are abnormal for the child as well.

CASE 24232

PRESENTATION OF CASE

A fifty-two-year-old American businessman was admitted complaining of cramping abdominal pain.

For one week before entry the patient suffered from intermittent cramplike pain in the lower abdomen. The pain was sufficiently severe to cause him to double up and on several occasions morphine was required for relief. Between pains there was a persistent, dull, aching soreness in the lower abdomen more pronounced on the left side. During the week of illness the temperature ranged between 100 and 102°F. Associated with the cramps there were nausea and vomiting, and the patient was unable to eat very much food. On occasion the pain was accompanied by a "bearing down" sensation and a great urgency to defecate. Throughout the week of illness there were almost constant bubbling and grinding noises in the abdomen.

The patient's stools had always been rather loose.

Parsons, R. J. The pituitary gland and its relation to age, hypertension and pathological processes: a study of 107 unselected pituitaries. *Medical Papers Dedicated to Dr. Henry A. Christian*. Baltimore: Waverly Press, Inc. 1936. Pp. 366-405.

in consistence and for about fifteen years he had had three to six watery bowel movements daily. Since the onset of the current attack the frequency increased, but the amount of each movement became scanty. The stools never contained pus or blood. There was no loss of weight.

About three years before coming to the hospital the patient had had an attack of pain similar to the present illness. At that time there were nausea, vomiting, fever and frequent, small stools. On occasion since then there had been brief twinges of lower abdominal pain lasting for a day or two.

Physical examination showed a well-developed and nourished man in no acute distress. The pupils were equal and reacted normally to light. The lungs were clear. The heart was normal. The blood pressure was 125 systolic, 80 diastolic. The abdomen was full and soft. No spasm was elicited. A smooth, slightly tender, baseball-sized mass was palpated in the left iliac fossa. It appeared to be fixed in this region. Peristalsis was definitely hyperactive, and the upper abdomen slightly tympanic.

The temperature was 99°F, the pulse 90. The respirations were 22.

Examination of the urine was negative. The blood showed a red-cell count of 4,140,000 with 75 per cent hemoglobin, and a white-cell count of 14,000 with 78 per cent polymorphonuclears. The nonprotein nitrogen of the blood was 21 mg per cent, and the serum chlorides were equivalent to 100 cc N/10 sodium chloride. A blood Hinton test was negative.

A plain x-ray film of the abdomen showed a moderate quantity of gas in the small bowel and colon. The loops of small bowel were not appreciably dilated. There were no areas of calcification in the region of the kidneys, but small areas were seen in the true pelvis near the lower ends of the ureters.

A barium enema passed to the cecum without delay and entered the terminal ileum. An area of the colon at the junction of the descending portion and sigmoid showed a constant narrowing for a distance of about 5 cm. The mucosa throughout this area was intact, and no intraluminal defects were present. This area evidently corresponded to the palpable abdominal mass. On the films taken after evacuation barium was seen extending out into the soft tissues beyond the lumen of the bowel at the point of narrowing. Multiple small diverticula were seen throughout the sigmoid and lower descending colon. There was gas in the small bowel in close proximity to the lesion in the colon.

On the second hospital day a laparotomy was performed.

DIFFERENTIAL DIAGNOSIS

DR EDWARD L. YOUNG: Cramp-like abdominal pain in the abdomen associated with nausea is always indicative of some irritation of the bowel, and this may be anything from food injudiciously chosen to the partial obstruction of a malignant tumor. In this particular case it had persisted for a week, and that alone would seem to rule out a digestive upset. The abdominal borborygmi that are spoken of merely back up the diagnosis of irritation and suggest a partial obstruction. The "bearing down" sensation and the desire to defecate suggest that the trouble was fairly low down in the large intestine. The fact that he had had three to six watery movements a day for fifteen years suggests a habit peculiar to the individual rather than a background of disease. The lack of pus and blood also tends to rule out any ulcerative condition. The history suggests that there had been something present for at least three years. That, plus the facts that there had been no loss of weight or apparent change in his general condition and no evidence of abnormality in the stool, other than the looseness, would make cancer very unlikely.

On examination there was a slightly tender mass in the left iliac fossa, a slight fever and a somewhat elevated white count. The examination and laboratory work were otherwise essentially negative. The x-ray tells us that there was no evidence of growth in the large bowel even at the area corresponding to the palpable mass. It does add two facts of great importance, which, taken with the other evidence, would seem to make the diagnosis certain. First, there were diverticula in the sigmoid and descending colon and, secondly, the barium seemed to extend outside the lumen of the bowel into the soft tissue at the point where the mass was palpable. Although it is possible for a single diverticulum of the large bowel to exist and perforate, it is much more usual for them to be multiple, thus increasing the numerical chances of infection and perforation. In this individual it seems to me we are entitled to say with a very high degree of certainty that he has diverticulitis with perforation and abscess formation. I think the surgeon should plan his attack on that basis.

Is there anything else that should be considered seriously? We have ruled out cancer. Appendicitis and the other possibilities such as solitary ulcer, amebic granuloma, and so forth would seem to me too rare to be seriously considered.

CLINICAL DISCUSSION

DR RICHARD H WALLACE Dr Arthur W Allen operated on this case and found the mass to consist of a loop of sigmoid with an abscess on its mesial side walled off by small intestine. The abscess cavity contained about 120 cc. of thick foul pus, and when this was removed by suction, there was a necrotic defect in the sigmoid the size of a quarter. Closure of the defect seemed impossible and drainage on the mesial side, where small bowel could not be excluded, seemed unwise. The only reasonable alternative, even in the presence of so much infection, was resection, this was done by freeing the sigmoid and removing the involved area. The two ends of the cut sigmoid were brought out close together in the wound. Stab-wound drainage was established in the lateral gutter where the retroperitoneal space was opened to free the sigmoid. The patient had a surprisingly smooth convalescence and has since had the ends of his sigmoid united so that he is at present quite well.

CLINICAL DIAGNOSIS

Diverticulitis of sigmoid

DR YOUNG'S DIAGNOSIS

Diverticulitis of sigmoid, with abscess formation

ANATOMICAL DIAGNOSIS

Diverticulitis of sigmoid

PATHOLOGICAL DISCUSSION

DR. BENJAMIN CASTLEMAN The resected specimen of sigmoid contained several small diverticula, the largest measuring about 1.5 cm in depth and 0.5 cm in diameter. The mucosa around one of these diverticula was markedly congested and further exploration showed that this one opened into the ragged abscess cavity in the pericolic fat that was broken into at operation. The surrounding fat was quite indurated. Histologically there was no evidence of cancer.

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DIFFERENCES IN OPPORTUNITIES FOR HEALTH

PERHAPS one of the greatest problems before humanity is the lack of application of accurate knowledge to the prevention and cure of illness.

Although we are confronted with certain unsolved questions relating to etiology and treatment of disease, science has brought to full understanding the essential facts of so large a proportion of the disorders of human beings that the sum total of medical and allied resources outweighs the deficiencies. But even so the preventable diseases are not being prevented and the curable ones are not being cured, to a deplorable degree.

If there is doubt about the truth of this last statement, the article under the above caption by Mountain and O'Hara in *Public Health Reports*

(53 485-496, 1938) may be read with interest. These authors record statistical evidence showing the relative incidence of illness existing in families comprising certain groups, living under different financial resources. For example, the rate in families on relief exceeded that among the gainfully employed by a large figure, thereby indicating that poverty is an important determining factor.

The study of this subject necessarily includes the relation of preventive medicine to the problems involved. In this latter field, agencies other than those connected with services rendered by physicians share with the practitioner the responsibility of dealing with existing conditions.

How far poverty is an indication of low intelligence or misfortune is an important question in dealing with human distress. Here the attitude of the state has its place, for the ratio of illness in families with incomes of \$3,000 or more of 156 per 1000 persons, as compared with 188 in the less than \$1,000 group and 262 for those on relief, calls for explanatory studies. Mortality as well as morbidity rates in these several income groups seem to carry the same implication as that shown by statistics relating to deaths due to tuberculosis, pneumonia, cancer, heart and kidney diseases, infantile diseases and accidents.

So far as inadequate medical care is a contributory factor in ill-health, there was evidence tending to show that the lower the income the less medical service is rendered, except in the group of hospitalized indigents. The statistics relating to surgery are also of interest in this respect, for people with little money are apt to neglect surgical attention except in emergencies.

In dealing with all health matters there seems to be a tendency, among certain people, to regard the medical profession as blameworthy for unsatisfactory conditions, and too often there have grown out of this misconception arguments for state medicine which, in the opinion of some politicians, seem to require the employment of physicians for the treatment of all illness at government expense.

A consideration of all factors involved in this subject shows that medicine alone is not the cure-all for existing conditions, but that together with

medicine there must be the co-ordinate confluence of public-health, social and economic measures. Even with all these agencies geared to high efficiency, progress will depend in large measure upon the higher average intelligence of the people. Ignorance, prejudice and shiftlessness are now, and will be for some time to come, obstacles in the way of better health.

Medicine will do its part individually and collectively. It only asks for fair and courteous treatment by the people.

A CENTURY OF MEDICINE

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tion of energy, the establishment of organic chemistry and the annihilation by Pasteur of the doctrine of spontaneous generation.

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MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

RAYMOND S. TITUS, M.D., *Secretary*
330 Dartmouth Street
Boston

CASE HISTORY NO. 75 PARTIAL PLACENTA PREVIA

A forty-eight-year-old Irish-American nonipara was admitted to the hospital at term for the treatment of vaginal hemorrhage. She had had crampy abdominal pains and backache for three weeks preceding entry. She had passed considerable bright-red blood by vagina one week before entry. There was some staining and the passage of clots daily during the next week until the night before entry, when she had another alarming hemorrhage. The bleeding was not associated with pain.

The family history was negative. The patient had always been well. She had had seven normal full-term deliveries and one miscarriage at the third month. Her menstrual periods began the age

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of thirteen and had always been regular and normal except for interruptions due to pregnancy

Physical examination revealed a well-nourished, normally developed woman. The skin was dry and slightly pale. The general physical examination was negative except for varicosities of both lower legs and the vulva, and edema of both ankles. The temperature was 98.6°F., pulse 84, respirations 20 and blood pressure 128 systolic, 90 diastolic. There was some old and fresh blood about the vulva. Abdominal palpation revealed a term pregnancy, position LOA, uterus of normal consistence, and fetal heart absent. The pelvic measurements were: intercrural, 32 cm., interspinous, 31 cm., external conjugate, 20 cm., and transverse diameter of the outlet, 9 cm. A catheter specimen of urine was straw-colored and acid, and contained a large trace of albumin. The sediment was negative, as was an examination for sugar.

The patient was immediately grouped for transfusion and prepared for examination. Under gas-oxygen and ether anesthesia, the cervix was found to be two-fingers dilated. There was a partial placenta previa, which accounted for the vaginal hemorrhage. A Braxton-Hicks' version was easily performed. One foot was pulled down into the vagina. A dead and macerated baby was delivered in twenty minutes by means of strong traction on the leg. There was moderate difficulty with the aftercoming head. The baby weighed 9 lb. The cervix was inspected because of profuse bleeding. A right lateral tear was repaired with interrupted chromic catgut sutures.

The patient was transfused with 500 cc of citrated blood. The blood pressure was 64 systolic, 42 diastolic, fifty minutes after delivery, the pulse was 96, and the respirations 20. In spite of the transfusion the patient began to complain of air-hunger and went into severe shock within a half hour. A second transfusion was administered. Her condition, however, did not improve, so a supracervical hysterectomy was performed under light gas-oxygen and ether anesthesia. A rupture of the uterus into the right broad ligament was encountered at laparotomy. This rent was repaired following amputation of the uterus. One drain was inserted through the cervix and another was brought out through the abdominal wound. Since her condition was very poor at conclusion of the operation, she was given a third transfusion. The blood pressure then rose from 50 systolic to 80. During the next four days she received fluids by intravenous and subcutaneous injections, as well as two more transfusions. She developed, however, rapidly increasing abdominal distention which was not relieved by Pituitrin, enemas and flaxseed poultices. She expired on the fourth day, with signs of general peritonitis.

Comment This is a very interesting case. The large trace of albumin and the dead baby suggest a toxemia with a separation of the placenta, but the examination revealed a partial placenta previa. It may well have been that the toxemia was the cause of the dead baby and the separation of the placenta. It is not at all common for placenta previas to bleed enough to cause intrauterine death unless the mother is exsanguinated.

The treatment of this case was poor. A bag probably would have been quite successful. As the partial previa was a very minor affair, rupture of the membranes alone might have been sufficient. The Braxton-Hicks' maneuver should have been carried through conservatively, a leg merely being brought through the cervix to act as a tamponade and the rest of the delivery left to nature. Rapid delivery caused this ruptured uterus, and the death is definitely attributable to the management of the case rather than to the partial previa, which was the cause of the bleeding.

DEATHS

HEALY — HARRISON T. HEALY, M.D., of New Bedford, died June 1. He was in his fifty-sixth year.

Born in New Bedford, he was graduated from high school, received his doctor of pharmacy degree from the Massachusetts College of Pharmacy and was awarded the degree of doctor of medicine from the Baltimore Medical College in 1907. Dr. Healy began practice in New Bedford and served as physician to the welfare department and as parochial school medical inspector.

A former fellow of the Massachusetts Medical Society, he was a member of the New Bedford Medical Society and the Massachusetts Clinical and Surgical Association.

His widow, four sons, two daughters, a brother and a sister survive him.

ILSLEY — FREDERICK R. ILSLEY, M.D., of Medford, died April 28. He was in his sixty-ninth year.

Dr. Ilsley received his degree from the Harvard Medical School in 1892. He was a fellow of the American Medical Association and a retired fellow of the Massachusetts Medical Society.

MISCELLANY

DANGEROUS TICK BITES AVOIDABLE BY A FEW SIMPLE PRECAUTIONS

Fear of the tick that carries Rocky Mountain spotted fever in the East need not keep people indoors this summer. The tick's principal danger lies in its bite. Bites can be avoided by a few simple precautions, according to Dr. F. C. Bishopp, of the Bureau of Entomology and Plant Quarantine, United States Department of Agriculture. At the same time, Dr. Bishopp emphasizes, failure to take these precautions may have serious consequences. The East has an unusually large number of common dog or wood ticks this year—some being reported for the first time from vacant city lots. Even though only one in several hundred of these ticks may carry the fever virus, that one tick, which cannot be distinguished from the rest

medicine there must be the co-ordinate confluence of public-health, social and economic measures. Even with all these agencies geared to high efficiency, progress will depend in large measure upon the higher average intelligence of the people. Ignorance, prejudice and shiftlessness are now, and will be for some time to come, obstacles in the way of better health.

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M. Kark, D.C.H., London '37, as research fellow in medicine, Max J. Kleiner, M.D., Boston University '37, as research fellow in medicine, Paul Kunkel, M.D., Washington University, St. Louis '34, as research fellow in medicine, Jesse C. Lockhart, M.D., University of Texas '35, as research fellow in medicine, Eugene L. Lozner, M.D., Cornell '37, as research fellow in medicine, John A. Luetscher Jr., M.D., Johns Hopkins '37, as research fellow in medicine, Jack D. Myers, M.D., Stanford '36, as research fellow in medicine, Reno R. Porter, M.D., Medical College of Virginia '35, as research fellow in medicine, Lowell A. Rantz, M.D., Stanford University '36, as research fellow in medicine, Andrew Yeomans, M.D., Harvard '35, as research fellow in medicine, William D. King, Jr., M.D., Baylor University '36, as research fellow in medicine, Alfred W. Harris, M.D., Washington University, St. Louis '35, as assistant in medicine, Raymond DeL. Adams, M.D., Duke University '36, as assistant in neurology, Robert A. Clark, M.D., Harvard '34, as assistant in psychiatry, Charles M. Krinsky, M.D., Tufts '33, as assistant in psychiatry, George F. Sutherland, M.Sc., McGill University '32, as research fellow in neuropathology, Samuel F. Martin, M.D., Harvard '34, as assistant in ophthalmology, Garrett L. Sullivan, M.D., Harvard '34, as assistant in ophthalmology, William A. Elliston, F.R.C.S., England '34, as assistant in orthopedic surgery, Carroll B. Larson, M.D., University of Iowa '33, as assistant in orthopedic surgery, Joseph M. Kmecca, S.M., Purdue University '37, as research fellow in comparative pathology and tropical medicine, David H. Clement, M.D., Harvard '35, as assistant in pediatrics, Edward C. Curnen, Jr., M.D., Harvard '35, as assistant in pediatrics, Robert H. Smith, M.D., Northwestern University '37, as teaching fellow in physiology, George Austen, Jr., M.D., Harvard '34, as assistant in genito-urinary surgery, Henry F. Howe, M.D., Harvard '30, as assistant in surgery, Samuel Lewis, M.D., Harvard '34, as assistant in surgery, Charles E. MacMahon, M.D., Harvard '36, as assistant in surgery

Mallinckrodt Chemical Works

Aminoacetic acid

Mulford Colloidal Laboratories

Rhus Tox. Antugen-Strickler, packages of two 1 cc. syringes

Rhus Venenata Antugen-Strickler, packages of two 1 cc syringes

Parke, Davis & Co

Theelin

Ampules Theelin Aqueous, 1 cc.

Ampules Theelin in Oil, 1 cc.

Vaginal Suppositories Theelin

Theelol

Kapseals Theelol, 0.06 mg

Kapseals Theelol, 0.12 mg

Sharpe & Dohme

Tablets Sulfanilamide, 5 gr

Gas-Gangrene Antitoxin (Combined) Concentrated

Gas-Gangrene Antitoxin (Combined) Unconcentrated

PAUL NICHOLAS LEECH, *Secretary*

535 North Dearborn Street,

Chicago, Illinois

REPORTS OF MEETINGS

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital on March 8, Dr A. Baird Hastings presiding

The medical case was presented by Dr Carl Shepard. The patient, a nineteen-year-old white male, had noted occasional swelling of his face and feet at irregular intervals for seven months. He had experienced blurring of vision for four months, and there had been nocturia for three months. He had boiled his urine, and found that it solidified in the container. Examination on entry to the hospital revealed generalized edema, ascites, bilateral hydrothorax, pulmonary congestion and retinal edema with white retinal exudate. The blood pressure was 190 systolic, 145 diastolic. The urine contained a large trace of albumin, and a few red and white blood cells. The urinary excretion of albumin amounted to 40 gm per day. The blood nonprotein nitrogen and blood urea nitrogen were not elevated. The total protein of the blood serum was 3.5 mm per cent, with reversal of the albumin globulin ratio. The red blood-cell count was 2,700,000, and the hemoglobin 48 per cent (Sahli). The phenolsulfonphthalein excretion was reduced to 25 per cent in two hours. The patient was given a high protein, salt free diet, and fluids were restricted to 1000 cc. per day. There was a marked diuresis and loss of 30 lb in weight. Dr Henry Christian remarked that this was a typical case of glomerular nephritis.

The surgical case was a forty three year-old white male, who had suffered a bout of phlebitis of his left leg twenty-five years previously and had subsequently developed swelling of the leg which had reached very large dimensions and had been subjected to two plastic operations nine years later. Seven years before entry he suffered an attack of multiple abscesses in the leg, and six months previously, after trauma to the lower leg, he again experienced sepsis in the water-logged tissues. On entry to the hospital the patient was febrile and showed a red, swollen, edematous leg, which measured 90 cm. in diameter at the mid-calf. After treatment with moist heat and elevation, the edema subsided and 30 lb of weight were lost due to drainage of fluid from the leg. Two plastic

CORRESPONDENCE

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

To the Editor

In addition to the articles enumerated in our letter of April 30 the following have been accepted

Abbott Laboratories

Dextrose 10 per cent in Ringer's Solution

Ringer's Solution

Tablets Phenobarbital Sodium Abbott, 1 gr

Mixed Grass Pollen Extract, Decimal Dilution Set (Abbott)

Drug Products Co., Inc.

Pulvoids Sulfanilamide, 5 gr

Chas. C. Haskell & Co., Inc.

Sulfanilamide Tablets, 5 gr

Hospital Liquids, Inc.

Viosterol (A R P I Process) in Oil

Lederle Laboratories, Inc.

Anupneumococcic Serum Types V and VII (Lederle)

Refined and Concentrated

Anupneumococcic Serum Types IV and VIII (Lederle)

Refined and Concentrated

Eli Lilly & Co

Ampoules Ephedrine Sulfate Lilly, 1 cc., 0.025 gm

is an agent of death. No cure for Rocky Mountain spotted fever is known. Its mortality rate is one out of every five persons infected.

After passing the first part of its life as a small parasite on field mice, the tick waits in tall grass and underbrush for larger host animals. Cutting all grass and underbrush around houses and pathways, therefore, is one way to protect dogs and people from tick bites.

Keeping ticks from gorging themselves on the blood of dogs is another protective measure. A pair of forceps is all that is needed in removing ticks from dogs to which only a few have attached themselves. Dusting every five days with derris powder is necessary for dogs supporting a large number of ticks. Ticks should be handled with great care, Dr. Bishopp points out. Infection can be contracted by crushing a tick full of blood from an animal that has had the fever.

Boots laced up over trouser legs protect men walking through tick infested areas, as ticks are usually picked up from grass or weeds close to the ground. Ticks always work their way upward before attaching themselves to their human host. The back of the neck and head are their favorite feeding places. Careful examination of heads, especially children's, at least twice a day, will reveal the presence of a tick in time to prevent a fatal bite. Examination of the whole body is necessary after exposure to ticks. An effective way to de-tick clothes is to place them in a vessel that can be tightly covered, and set on top of them a pan containing half a teacupful of carbon tetrachloride or carbon disulfide. A few hours of such fumigation kills the ticks.

"Don't wait for the doctor to remove a tick," Dr. Bishopp warns. The important thing is to get the tick off as soon as possible. Anyone can disinfect the bite and the surrounding tissues by inserting into the exact spot where the tick was attached a round toothpick that has been dipped in iodine and drilling it in slightly.

The American dog tick is widely distributed throughout the United States east of the Rocky Mountains, as well as in western and northern California and in parts of Oregon. It is most numerous along the eastern coast from Massachusetts to Florida, especially within a few miles of the shore. Both Texas and Florida have a great many ticks—also some inland areas, such as southern Iowa and parts of Wisconsin and Minnesota. Islands off the coast of Massachusetts are heavily infested with ticks, especially Martha's Vineyard, Nantucket and Naushon. Tick numbers fall off along the sea coast from Marion, Massachusetts, westward. The Narragansett Bay islands are rather heavily infested. A few ticks have been reported on the west side of that bay and as far west as Stonington, Connecticut. There are large numbers of ticks on Long Island, especially the eastern half, and along Chesapeake Bay in Maryland. They are rarely seen west of the Blue Ridge. — *United States Department of Agriculture*

WHAT MIDWESTERN SMALL-CITY FAMILIES SPEND FOR MEDICAL CARE

Midwestern small-city families are more likely to economize by not seeing the dentist, the oculist or even the doctor than by not buying supplies for the family medicine chest, when funds run low. This tendency is indicated in a table of medical expenditures for 3118 native white non-relief families living in seven representative cities in five midwestern states. The table is a part of a nationwide study of how much money the American family makes and how it is spent, conducted under the direction of Dr. Louise Stanley, chief of the Bureau of Home Economics, United States Department of Agriculture.

The cities studied were Lincoln, Illinois, Boone, Iowa, Columbia and Moberly, Missouri, Mount Vernon and New Philadelphia, Ohio, and Beaver Dam, Wisconsin.

Low-income families consult dentists less frequently than doctors, and visits to the oculist usually are omitted entirely. But a majority of families at all income levels (67 to 92 per cent) reported expenditures for medicines and drugs during the twelve-month period studied in 1935-36. Amounts spent for medicine, however, were not high, averaging \$6 to \$21 per family per year at the different income levels. Averages were based on all families including those that made no purchases for the medicine chest.

Income for the year reached the \$500 level before as many as half the families reported expenditures for a physician. Incomes of nearly three times this amount (\$1250-\$1499) were reached before as many as half the families had any expense for the dentist during the year. Even at the \$4000-\$4999 level only one family in four paid an oculist fee.

Fewer than 40 per cent of the families in the lowest income class studied (\$250-\$499) spent money for doctors fees during the year, fewer than 12 per cent spent for dentists' services, and none of these families incurred any expense for an oculist. However, 67 per cent bought some medicine.

Approximately half the families in the second lowest income class studied (\$500-\$750) had expense for the physician, one in four, for the dentist, and practically none—less than 0.5 per cent—for the oculist. Three families out of every four bought some medicine-chest supplies.

Nearly all families of income levels above \$500 (90 to 99 per cent) had some expenditure for medical care during the year. But even at the highest income level studied (\$5000 to \$10,000) only three families in four reported expense for a physician, four families in five for a dentist, and fewer than one in four for an oculist.

It is evident that a majority of families with very low incomes did not have periodic physical examinations by a doctor and did not have the condition of their teeth checked regularly by a dentist," says Dr. Stanley. "Average amounts spent for medical care in low income groups were not sufficient to pay for such routine services for all family members, even if the costs of serious illnesses had not been added in many instances. Since it is likely that families with low incomes need even more medical care than those that are well-to-do, these figures seem to indicate inadequate health measures. They support the contention of many social workers and others, that society should help provide adequate medical care for those who cannot pay the cost." — *United States Department of Agriculture*

NOTES

The University of Montreal has conferred the doctorate of science on Dr. M. L. Fernald, Fisher professor of natural history at Harvard University. The presentation was made preceding a course in botany given at the university by Dr. Fernald. — *Science*, June 3, 1938

Thirty-three appointments to the teaching and research staff of the Harvard Medical School were recently announced as follows:

Franz J. Ingelfinger, M.D., Harvard '36, as assistant in medicine, John C. Larkin, M.D., Johns Hopkins '35, as assistant in roentgenology, Joseph Meyer, M.D., Northwestern '36, as assistant in medicine, Lewis Dexter, M.D., Harvard '36, as research fellow in medicine, Arnold Iglaier, M.D., Cincinnati '37, as research fellow in medicine, Robert

membrane is impermeable to base, to phosphate and to sulfate. But during metabolic activity, base and phosphate pass in one direction or another, apparently in accordance with the needs of the cell. Movements of these substances are not accomplished merely by diffusion; they must involve chemical reactions.

Various experiments have indicated that the principles which control the exchanges of water and solutes between the red blood cells and serum also control the exchanges between the cells of all tissues and the interstitial fluid. Analyses have indicated that approximately 20 per cent of muscle tissue has the composition of an ultrafiltrate of serum, that is, so far as inorganic elements are concerned it contains chiefly sodium and chloride. Diffusion experiments indicate that there is a barrier in muscle tissue which differentiates about one fifth of the tissue from the other four fifths. Sodium, chloride and inorganic phosphate diffuse readily into one fifth of the muscle mass but do not cross the barrier into the cell (under resting stable conditions), while urea diffuses readily throughout the whole mass. Under the stimulus of glucose and insulin the concentration of phosphate esters in the muscle increased, indicating that, as in the red blood cell, the stimulus of metabolic activities initiated chemical processes which conveyed phosphate across the cell membrane that it ordinarily did not traverse.

The percentage of interstitial fluids was measured more directly by means of injecting substances which were not normal constituents of serum and which would pass freely through vascular walls without penetrating cells. Three substances were utilized for this purpose: a sulfocyanate, a sulfate and sucrose. Determinations of the distribution of these substances throughout the body again indicated that there is a barrier which separates the fluids of the body, in a broad way, into two compartments, of which one, into which these substances chiefly or solely diffuse, makes up roughly 20 to 30 per cent of the body weight.

By using the same principle but employing thio-urea which possesses most of the chemical and physiological properties of urea but is excreted completely unchanged in the urine, an attempt was made to measure the total water in the body. The volume of distribution of this substance varied from 68 to 70 per cent of the body weight—values consistent with accepted conceptions of the water content of the body.

Studies of the distribution of sodium sulfate throughout the body after injection of hypertonic solutions of this substance again gave results compatible with the theory that sulfate, sodium, chloride, and sulfocyanate were distributed over an identical fraction of the total water of the body, and that this fraction, approximately one fifth of the body mass, increased in volume by one liter. This expansion in volume must have been accounted for by acquisition of fluid from other parts of the body, namely the cells, since the hypertonic solution increased the osmotic pressure of the interstitial fluid, and water was withdrawn from the cells to restore osmotic equilibrium.

Tissue cells then, appear to resemble red blood cells in their general behavior: they seem to contain less sodium and to be more nearly if not completely devoid of chloride. When the concentration of sodium in the interstitial fluid changes, osmotic equilibrium is restored by transfers of water to or from the cells without transfers of base. There is no evidence that base is admitted to or discharged from the cells in behalf of osmotic equilibrium *per se*. The concentration of sodium in the interstitial fluids controls the water content or size of the cells. Consequently, it must determine the dilution of the

cellular constituents. The actual quantities of these constituents in the cells, however, appear to be controlled by entirely different mechanisms. There must be some means by which potassium, phosphate and other chemical substances are restrained in the cell to protect the integrity of the cellular composition. It is equally essential that there be some means of dissolving this restraint when need arises in the cells for more of these materials or for the discharge of any excess. Apparently the regulation of these restraining forces is delegated to the metabolic processes of the cells, thus insuring automaticity.

The tissue cells differ from the resting red blood cells with respect to the passage of potassium across the cell membrane. Apparently potassium diffuses freely throughout all the water of the body, and in addition, variable amounts enter some or all the tissue cells. Whether or not this fraction is taken *into* the cells by means of diffusion, it must be restrained *within* the cells by some other mechanism. Phosphate diffuses freely through the interstitial fluids but not into the cells. A certain amount does penetrate the cells. It must be supposed that this fraction gains access to the cells and is there retained by something other than diffusion.

These phenomena may be correlated as follows: the cells and interstitial fluid are in osmotic equilibrium, this osmotic equilibrium is maintained in spite of the extreme diversity of the two mediums by virtue of the fact that the interposed membranes do not allow free interchange by diffusion of a variety of substances, especially protein, sodium, chloride and phosphate. Sodium and chloride, in fact, seem to be almost completely, if not completely, excluded from the cells, although they are the chief inorganic components of interstitial fluid. It follows that any changes in the concentration of sodium in the interstitial fluid must result in an exchange of water that will restore equality of osmotic pressure between the two mediums. The volume of the intracellular fluid must therefore depend upon the concentration of sodium in serum. Ordinarily, the concentration of potassium in interstitial fluid is only a small fraction of the concentration found in cells. Nevertheless, when potassium salts are added to the system, potassium enters the cells in such proportions as to give the impression that extracellular and intracellular potassium are in simple diffusion equilibrium. If the cell membrane is freely permeable to potassium, this permeability must be restricted to a small fraction of the intracellular potassium, since the concentration of potassium in interstitial fluid is so low. The major portion of the intrinsic potassium of cells, since it does not diffuse outward, must be restrained from free diffusion by some force other than mere impermeability of the envelope of the cell.

Dr. Peters cited several observations illustrating the inferences to be drawn from the above stated hypotheses. Gamble found that in the dehydration of starvation acidosis potassium as well as sodium was wasted, a wastage which also occurred in the diuresis produced by acidifying salts. This wastage of potassium was not due to losses in extracellular sodium with resultant changes in intracellular potassium, since even with extreme depletion of body sodium there were only insignificant losses of potassium. In Addison's disease and in some animals after adrenalectomy, sodium wastage is accompanied by retention of potassium, although there is no rise of serum potassium. The potassium apparently enters or becomes imprisoned in the cells. Analyses of the tissues of rats after adrenalectomy have shown that there is an increase in cellular potassium without a comparable increase in water. This exemplifies the accumulation in the cells of osmotically in

operations were performed by Dr John Homans, with removal of large masses of fibrous, edematous tissue. Following each operation there were severe septic complications which were treated with Prontylin with good results. A third plastic operation was not followed by infection. Following granulation, very large Thiersch grafts were applied.

Dr Homans commented on the case, and stated that it was unusual to observe a case of elephantiasis nostra complicata by a suppurative sort of infection. In experimental elephantiasis it has been noted that, with the rise in the protein percentage of the tissue fluids, the animals are prone to attacks of fever due to non suppurative streptococci. This patient experienced suppurative attacks. The treatment consisted of removing all the tissue down to the muscle, bone, tendons, and so forth, beneath the aponeurosis.

Dr John P Peters, professor of internal medicine at Yale University School of Medicine, delivered the paper of the evening, speaking on the subject "Exchanges between Cells and Interstitial Fluids." Dr Peters presented a résumé of experiments performed in attempts to elucidate the processes by which water and various solutes, particularly inorganic constituents, find their way back and forth between cells and the interstitial fluids by which they are surrounded. These experiments were of two kinds: first, experiments in which the red blood cell was used as a model of general cellular reactions, secondly, investigations on the distributions of various solutes in the body.

Although the red blood cell is highly differentiated and unique in many respects it was particularly suited for these experiments because it could be isolated for analysis from its interstitial fluid, and because its metabolic processes could be brought to a standstill by chilling.

There is good reason to believe that the contents of the red blood cell have the same osmotic pressure as the blood serum and are in osmotic equilibrium with the latter. This means that in spite of differences in composition of the two mediums, cells and serum contain, per unit of water, the same concentrations of osmotically active chemical components. The differentiation of the two mediums depends on the highly selective permeability of the cellular membrane, which appears to be quite freely permeable to water, urea and certain other simple organic compounds, and to glucose under certain conditions. If water is added to blood it distributes itself between cells and serum in the same proportions as the water which was originally present in these mediums. The cells will therefore swell. Since urea can cross the membrane freely it will have no effect on the volumes of the cells, and solutions of urea will act exactly like equal amounts of water. If the cells were not quite impermeable to protein, hemoglobin would escape into the serum. Since the molecular concentration of protein in the red cells is more than three times as great as that in the plasma, it might be expected that the osmotic pressure of the cellular contents would be far greater than that of the serum. It is, of course, a similar difference in concentration of protein between plasma and interstitial fluids that, according to the Starling theory, balances the hydrostatic forces of the blood pressure, thus retaining fluids in the blood stream. In the equilibrium between cells and serum, however, the unequal distribution of protein is compensated by impermeability to other substances, especially the cations, sodium, potassium, calcium and magnesium. A 150 millimolar solution of sodium chloride has the same effective osmotic pressure as serum and as the contents of the red blood cells, that is, it contains per unit of water

the same concentration of osmotically active units that are restrained from crossing the cell membrane.

A series of experiments have proved that under certain standard conditions the human red blood cells are quite impermeable to the bases sodium, potassium, calcium and magnesium, and that, when the concentrations of base in the serum are changed, the cells give up or take on water in such proportions that the osmotic pressures in the two mediums always remain identical. The size and water content of these cells would seem to be entirely at the mercy of the serum in which they are bathed. These conclusions were verified by *in vitro* and *in vivo* experiments.

In the *in vitro* experiments it was also proved by direct analysis that no base passed into or out of the cells. In the *in vivo* experiments, however, when the same techniques were applied, unmistakable changes in the base of cells were detected. These findings were made in the very experiments in which changes of cell water and analyses of serum gave no evidence of transfer of base. Such results seemed paradoxical.

Although there is slightly more total base in serum, the concentrations in cells and serum are sufficiently alike to give the impression that, in the cells as in the serum, inorganic salts are chiefly responsible for the effective osmotic pressure. If this is the case, since the osmotic pressure of both media is the same, the concentrations of base in cells and serum should vary directly. Such is not the case. While serum base varies within relatively narrow limits, cell base varies over a much larger range. Furthermore, there is no demonstrable correlation between the two. Therefore base cannot have as important an osmotic role in cells as it does in serum. Osmotic equilibrium can exist when the concentration of base is distinctly higher in the cells than in the serum. In this case a fraction of the base in the cells must be osmotically inactive (perhaps because it exists in non-ionized form). It appears that any variation of base in serum is attended by a proportional change of osmotic pressure, whereas the base of cells can vary within wide limits without affecting osmotic pressure. The contents of cells are complex and include substances which do not exist in serum, but which must exert osmotic pressure. Moreover, in the cell, metabolic processes cause continuous permutations and combinations of solutes. Were these processes not osmotically buffered by some mechanism, they would produce constant changes in the volume and water content of the cells. There must be some means by which cells can, in times of need, accumulate or eliminate stores of material without being forced to take on or to excrete, at the same time, excessive amounts of water.

Red cells cannot be as completely impervious to base as would be inferred from *in vitro* experiments, else they would be excluded from elements essential for their activities. The impermeability of the cell membrane may be only a facultative property. Although cells are found to be impervious to phosphate and other ions in the resting state, if they are studied at higher temperatures such as are encountered in the body and in which metabolic processes are allowed to proceed, phosphate and potassium pour out of the cell during the process of glycolysis. This process was found to be reversible and was not purely mechanical in nature, but definitely a part of the metabolic process.

The red blood cell, then, appears to be always in osmotic equilibrium with its environmental fluid, blood serum. It responds to changes of the concentration of base in serum by transferring water and thus changing its volume. Moreover, so long as it is in the resting state, it

BOOKS RECEIVED FOR REVIEW

Physiological and Clinical Chemistry William A. Pearson and Joseph S. Hephurn. Second edition. 467 pp Philadelphia Lea & Febiger, 1938 \$5.50

Alfred Owre Dentistry's militant educator Netta W. Wilson. 331 pp Minneapolis The University of Minnesota Press, 1937 \$4.00

Child Care and Training Marion L. Faegre and John E. Anderson. Fourth edition, revised. 327 pp Minneapolis The University of Minnesota Press, 1937 \$2.50

Pediatric Surgery Edward C. Brenner. 843 pp Philadelphia Lea & Febiger, 1938 \$10.00

Surgical Anatomy of the Head and Neck John Finch Barnhill. 921 pp Baltimore William Wood & Company, 1937 \$20.00

Organization Strategy and Tactics of the Army Medical Services in War T. B. Nicholls. 372 pp Baltimore William Wood & Company, 1937 \$4.00

Medico-Legal Aspects of the Ruxton Case John Glaister and James Couper Brash. 284 pp Baltimore William Wood & Company, 1937 \$6.00

The Single Woman and Her Emotional Problems Laura Hutton. Second edition. 173 pp Baltimore William Wood & Company, 1937 \$1.50

The Radiology of Pulmonary Tuberculosis J. E. Bannen. 156 pp Baltimore William Wood & Company, 1937 \$4.50

Diseases of the Thyroid, Parathyroids and Thymus Andre Crotti. Third edition, thoroughly revised and enlarged. 1229 pp Philadelphia Lea & Febiger, 1938 \$20.00

Eat and Keep Fit Jacob Buckstein. 128 pp New York Emerson Books, Inc., 1938 \$1.00

On a New Gland in Man and Several Mammals (Glandulae Parathyroidae) Ivar Sandström. 44 pp Baltimore The Johns Hopkins Press, 1938 \$1.00

Pneumonia and Serum Therapy Frederick T. Lord and Roderick Heffron. 148 pp New York The Commonwealth Fund, 1938 \$1.00

On Thought in Medicine Hermann von Helmholtz. 27 pp Baltimore The Johns Hopkins Press, 1938 75c.

A Biological Approach to the Problem of Abnormal Behavior Milton Harrington. 459 pp Lancaster The Science Press, 1938

Twenty-eight Years of Sterilization in California 47 pp Pasadena The Human Betterment Foundation, 1938 25c.

Demonstrations of Physical Signs in Clinical Surgery Hamilton Bailey. Sixth edition, revised. 284 pp Baltimore William Wood & Company, 1937 \$6.50

Practical Methods in Biochemistry Frederick C. Koch. Second edition. 302 pp Baltimore William Wood & Company, 1937 \$2.25

Hemorrhoids Marion C. Pruitt. 170 pp St. Louis The C. V. Mosby Company, 1938 \$4.00

Symptoms of Visceral Disease. A study of the vegetative nervous system in its relationship to clinical medicine Francis Marion Pottenger. Fifth edition. 442 pp St. Louis The C. V. Mosby Company \$5.00

The Heart in Pregnancy Julius Jensen. 371 pp St. Louis The C. V. Mosby Company, 1938 \$5.50

Bile its toxicity and relation to disease O. H. Horraill. 434 pp Chicago The University of Chicago Press, 1938 \$4.00

Major Endocrine Disorders S. Levy Simpson. 184 pp London John Bale Medical Publications, Ltd., 1938 10/6d.

Practical Clinical Gynecology Henry C. Falk. 393 pp New York American Journal of Surgery, Inc., 1938 \$5.00

Internships and Residencies in New York City 1934-1937 Their Place in Medical Education Report by the New York Committee on the Study of Hospital Internships and Residencies. 492 pp New York The Commonwealth Fund, 1938 \$2.50

Essentials of Obstetrical and Gynecological Pathology With clinical correlation Marion Douglass and Robert L. Faulkner. 187 pp St. Louis The C. V. Mosby Company, 1938 \$4.75

BOOK REVIEWS

The Biology of Pneumococcus The bacteriological biochemical and immunological characters and activities of diplococcus pneumoniae Benjamin White. 799 pp New York The Commonwealth Fund, 1938 \$4.50

Occasionally a book appears which almost at once comes to be known as a standard work of reference. This extensive monograph on the pneumococcus by Dr. White and his collaborators will surely take its place among this class. With thoroughness and scholarly accuracy which could not be surpassed by the most laborious of the German scientific writers of the past, the senior author has read and re-read the significant literature on the subject, both old and new, and then in the light of his long experience has fashioned these multitudinous fragments into a lucid and critical account of the various aspects of what he most accurately characterizes as this amazing cell.

In the beginning there is an interesting statement of the early history of studies concerning the pneumococcus. In reading it, once again we are filled with respect and admiration for the pioneers who brought order and light to the chaos and darkness that confronted them. During the last quarter of the nineteenth century the etiological role of the pneumococcus in most cases of lobar pneumonia was definitely established—not by any means a simple demonstration when we consider the variegated flora encountered in sputa and the difficulty, now hardly overcome, of producing experimentally the disease in anything like its natural manifestations. By this time, too, many of the fundamental facts concerning the cultivation, identification and antigenic attributes of the pneumococci were recorded. It is chastening to consider that much of the work of the past thirty-eight years has consisted in widening and leveling the paths which Pasteur, Fränkel, Denys, Mennes, Metchnikoff and others had so unerringly demarcated. In the following chapters, each of which may be regarded as a compendious though nonetheless comprehensive monograph on its specific subject, the authors treat of the biologic characteristics of the pneumococci, their classification, dissociative phases, degrees of pathogenicity for man and animals, and their chemical composition, especially in respect to antigenic structure. The final pages deal with the complex factors involved in the resistance of the animal body to infection with these microorganisms. Here we are given along with what is known concerning the mechanisms of pneumococcal immunity, practical information concerning the technics of active immunization by means of vaccines, as well as the most recent methods of producing efficient antisera to be used in the treatment of lobar pneumonia. After a brief account of the rationale of specific therapy and an assay of the results which have been obtained in the clinic through

active potassium and suggests that removal of the adrenals gives rise to a widespread derangement of cellular metabolism. Adrenalectomized dogs are benefited by restriction of potassium in the diet and can be thrown into shock by administration of potassium salts. This is consistent with the hypothesis that the intrinsic potassium of the cells is affected by the supply of inorganic potassium in the interstitial fluid. Observations upon a case of Addison's disease indicated that potassium became more concentrated in the cells and showed that water and electrolytes moved in the directions indicated by the previously cited experiments.

Depletion of serum sodium is extremely common in clinical medicine. It is regularly encountered in the states of dehydration that result from severe vomiting, diarrhea or gastrointestinal fistulae, in diabetic acidosis, in water intoxication, in lobar pneumonia, in the terminal stages of nephritis and sometimes with no discoverable cause. It has been too generally assumed that in all these conditions, as well as in Addison's disease, depletion of base has the same quantitative and qualitative effects. Such is not the case, as is proved by the wide range of symptomatology associated with deficits of base and by the variability of the responses to restoration of the concentration of salt in the serum. Both the concentration of base in the interstitial fluids and the volumes of these fluids must be accurately measured if precise information is to be gained about the organism as an entity. In addition, the allocation of these fluids and solutes between the various compartments of the body cannot be neglected, since the animal organism is not homogeneous, and finally, the state and activity of these solutes are matters of no little importance.

NEW ENGLAND SOCIETY OF PHYSICAL MEDICINE

At the annual meeting of the New England Society of Physical Medicine, held at the Hotel Kenmore, Boston, on May 18, the following officers were elected: president, Dr. Hosea W. McAdoo, of Arlington, first vice president, Dr. George B. Carr, of Lynn, second vice president, Dr. Henry A. Tadgell, of Wrentham, secretary, Dr. William D. McFee, of Boston, treasurer, Dr. Howard Moore, of Boston, councilors for three years, Dr. David T. Percy, of Arlington, and Dr. Charles W. Bruninghaus, of Worcester. Dr. Kristian G. Hansson, director of physical therapy, Cornell Medical Center, New York City, spoke on "After-care of Poliomyelitis." The paper was discussed by Dr. William T. Green.

NOTICES

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, June 21, at 12 o'clock noon.

Dr. Edward J. O'Brien will speak on "Twenty five Years' Experience with Obstructing Prostates," the talk will be illustrated with moving pictures of a transurethral resection of the prostate gland.

LAWRENCE CANCER CLINIC

The regular Lawrence Cancer Clinic, to be held at the Lawrence General Hospital, 1 Garden Street, Lawrence, on

Tuesday, June 21, at 10 00 a. m., will be a demonstration and teaching clinic for physicians, with Dr. Channing C. Simmons present as consultant. Physicians of the north half of Essex County are invited to accompany any of their patients whom they desire to have this service or to send them with a note. A report will be returned to every physician who sends a patient. The service is gratis. Any physician is welcome to attend the clinic.

This clinic is endorsed by the Committee on Postgraduate Instruction of the Massachusetts Medical Society.

ROY V. BAKETEL, M.D.,
CHARLES J. BURGESS, M.D.,
JOHN J. MCARDLE, M.D.,
HARRY H. NEVERS, M.D.,
THOMAS V. UNIAC, M.D.,
J. FORREST BURNHAM, M.D., *Chairman*

NEW ENGLAND HEART ASSOCIATION

There will be a special meeting of the New England Heart Association in the Ether Dome at the Massachusetts General Hospital, Wednesday, June 22, at 8 15 p. m.

Dr. George W. Pickering, from the Department of Clinical Research, University College Hospital, London, England, will speak on "The Problem of High Blood Pressure in Man."

Interested physicians and medical students are cordially invited to attend.

EDWARD F. BLAND, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JUNE 13

TUESDAY, JUNE 14

*10 a. m. 12 30 p. m. Tumor clinic Boston Dispensary

FRIDAY, JUNE 17

*10 a. m. 12 30 p. m. Tumor clinic Boston Dispensary

SATURDAY, JUNE 18

*10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital
Conducted by Dr. Henry A. Christian

Open to the medical profession

JUNE 10 and 11—American Heart Association Page 707 issue of April 21
JUNE 13, 14 and 15—American Board of Obstetrics and Gynecology
Page 903 issue of May 26

JUNE 13-17—American Medical Association San Francisco

JUNE 13, OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 282 issue of February 10

JUNE 20-24—Canadian Medical Association Page 902 issue of May 26

JUNE 21—South End Medical Club Notice above.

JUNE 21—Lawrence Cancer Clinic Notice above.

JUNE 22—New England Heart Association Notice above.

JUNE 23—Pentucket Association of Physicians Hotel Bartlett 95 Main Street Haverhill 8 30 p. m.

SEPTEMBER 12-14—American Association for the Study of Gout Page 545 issue of March 24

SEPTEMBER 12-15—American Congress of Physical Therapy Page 946 issue of June 2

OCTOBER 17-21—Clinical Congress of the American College of Surgeons New York City

OCTOBER 24-26—Academy of Physical Medicine Scientific Session Washington D. C.

DISTRICT MEDICAL SOCIETIES

HAMPDEN

Meeting will be held on the fourth Tuesday in July

PLYMOUTH

Meeting will be held at 11 a. m. on July 21

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OBSERVATIONS OF A RURAL HEALTH WORKER

ANDRIJA STAMPAR, M.D.*

IT IS a great honor your university has bestowed upon me, in appointing me Cutter Lecturer for the current academic year. I wish to express to you my profound appreciation for the compliment you pay me in asking me to address you.

The title I have selected for my lecture is "Observations of a Rural Health Worker." There are several reasons for my choice, personal as well as general. During the past years I was connected with rural health work, either as a director of health in a rural country, or as a fieldworker in rural districts. The first country in which I was employed was Yugoslavia, and the second, the largest rural country in the world, China. Being connected also with the international health service conducted by the League of Nations, I visited a large number of countries, undertaking a series of studies, in particular on the problems of rural health.

While I was trying to carry out some of my assignments I was confronted with the problems of rural life, and I found that successful results in rural health work depend on a number of factors usually considered to be outside a physician's province.

* * *

In recent years, in every country there has been a growing consciousness of the significance and importance of rural health. Each country has its own traditions, its own changing economic and social situations, which leave their mark on the development of public health, and it is therefore impossible to recommend one system for all. There is, I think, one point on which all are agreed, namely, that arrangements for the care of the health of the great masses of peasants in nearly every country are still far from adequate, and that this question has given rise to the important problem of public health, which has become increasingly more urgent with the existing rural distress. The

The Cutter Lecture delivered at the Harvard Medical School, Boston, February 15, 1938.

Formerly director of health of Yugoslavia and expert on health matters for the League of Nations Health Section.

practical application of our knowledge in public health is difficult in rural districts. In countries where the population is mostly agricultural, we may find excellent health activities in the urban districts, but there is usually a lack of physicians and health services in rural districts. It is commonly known that the death rate is higher in rural than in urban and industrial districts, and that the occurrence of infectious diseases is also higher. Some decades ago rural districts were healthier in comparison with urban. Now, the discoveries and experiences in public health are better applied and carried out in urban and industrial areas.

The vitally important need for health workers in rural areas is universally recognized. There are still enormous rural areas in the world without any proper medical aid, and without any preventive work. Even in the countries which have produced certain important results in public-health work there are still rural districts entirely neglected from the standpoint of health. The distribution of physicians is not made according to the needs of the total population, only a small percentage of them live in rural districts. The same can be said about auxiliary personnel. An illuminating study conducted by Dr. Kacprzak in Poland, in regard to the distribution of the physicians in 105 districts out of a total 241, shows that in the urban areas there was one physician for 1394 inhabitants and in the rural areas one for 21,414. In the villages only about 40 per cent of the deaths were certified by a physician, and only 30 per cent of the confinements were attended by a trained midwife. Similar facts have been pointed out by Dr. Stoichia in Roumania, where in rural districts only 35 per cent of the deliveries were attended by a qualified midwife. While in the urban areas 65 per cent of the confinements take place in hospitals or maternity homes, in rural districts this percentage amounts to only 1.2. In 1935, in the villages, only 22.4 per cent of the

its use, the text concludes with a statement of unsolved problems

The appendix includes descriptions of the laboratory procedures employed in the bacteriological and serological study of the pneumococcus and in the preparation of antiserums, and finally an admirably arranged bibliography of nearly sixteen hundred items which cannot fail to become indispensable to both student and investigator alike.

In wholeheartedly recommending this book to all who have any concern with these organisms and their effects, the reviewer cannot refrain from expressing his regret that Dr White could not have lived to see his excellent treatise accorded those honors which it so manifestly deserves

Lebens Versicherungs Medizin Felix Deutsch and Fritz Stern 282 pp Vienna Emil M Engel, 1938

Life insurance medicine, as a systematic and comprehensive study of the ratings of extra mortality (substandard risks), has very seldom been treated in a form which could justifiably be called a *book of reference*. In the book which has just been published, the authors have fulfilled precisely this *practical* requirement.

Medical directors and examining physicians of life insurance companies will find in this book an indispensable aid for their daily work. Medical advisers will gain from it the necessary comprehension of the theoretical basis and the practical requirements of their practice as life insurance physicians, which is often not their main professional activity.

In addition to this, the book gives a systematic insight into a medical field whose importance for medicine—considering the high place of life insurance in the entire economic sphere—is not always fully realized by physicians. In order to show the doctor who is not familiar with life insurance medicine its connections with general medicine, the authors have covered the clinical as well as the statistical point of view.

The introduction contains the following remarks:

It is obvious that the ratings found in this book will not be primarily new ones, it was frequently necessary to use standard ratings which are already known. Nevertheless we have given new ratings for a considerable number of symptoms and diseases and have also attempted to establish ratings for impairments which have seldom or never before been rated. Finally, we have sought to describe and classify the impairments for which we have given ratings on the basis of recognized clinical findings. We have, moreover, supplemented the section on insurance medicine by a description of the applicable methods of examination and by a list of occupational and athletic hazards, as well as by an attempt to give ratings for the additional risks (supplementary insurance for invalidism and accidental death).

We believe that the essential quality of this book consists in the following features: (1) that all fields of medicine, insofar as they have any relation to insurance medicine, have been covered, (2) that the systematic classification and revision of the material have permitted us to discuss all combinations and bases of clinical symptoms which are important for insurance medicine, (3) that we have ventured to give definite standard ratings, in order to create a uniform objective basis for the premium, excluding all subjective interpretations, as a starting point for further investigations in this field, and (4) that, in order to advance insurance medicine as

a science, we have considered it necessary to dispense with the reticence which has formerly been maintained in the publication of standard ratings, and we have thus made the rating of substandard risks a subject for detailed discussion.

Lectures on the Epidemiology and Control of Syphilis, Tuberculosis and Whooping Cough and Other Aspects of Infectious Disease Thorvald Madsen. The Abraham Flexner Lectures Series No 5 216 pp Baltimore The Williams & Wilkins Company, 1937 \$3 00

This is a book of two hundred pages, containing the fifth series of the Abraham Flexner Lectures, given by Dr Madsen at Vanderbilt University in March, 1937. It is the sort of material the reviewer at first thought he would skim through lightly, but he found himself held to reading Dr Madsen's lectures page by page and line by line.

Five subjects are dealt with as follows: Control of Venereal Disease in Denmark, with Special Reference to Syphilis; "Mechanism of Bacterial Infection"; "Tuberculosis in Denmark"; "The Influence of Seasons on Infection"; "Whooping Cough."

The reader is impressed with the advanced social organization and unity of Denmark. This comes to the surface in many ways. Tuberculous cattle were killed and paid for by the government before the turn of the century, the first tuberculosis seals were sold there in 1904, and we are reminded of the contributions of Finsen and other famous Danes.

Dr Madsen is more than a public health worker, to the reviewer it seemed as though physiology was his basic interest, yet nowhere within this volume does he deal with essential physiological subjects.

The book is an entertaining little volume and the material contained within must have formed an interesting group of lectures.

How Ancient Healing Governs Modern Therapeutics: The contribution of Hellenic science to modern medicine and scientific progress Kleanthes A Ligeros 523 pp New York and London G P Putnam's Sons, 1937 \$10 00

One would look far to find a drearier book than this. The author takes a deal of space to prove what requires no proving, namely, that much that is most worth while in modern thought and civilization had its roots in ancient Hellas. To assume as he does, however, that practically every important measure used in treating the sick was possessed by the Greeks is a manifest absurdity. As to Hellenic concepts actually governing modern therapeutics, his real complaint is that a good many procedures which the Greeks thought valuable have been discarded by the medical profession, in particular chiropraxis or manipulation of the spine.

But a fallacious thesis is not all that is the matter. There is a dearth of information from original sources, and even what is furnished is not entirely apropos. Nor, unfortunately, has Dr Ligeros any gifts as a writer. He is wordy, repetitious and prosy, and still worse, is given to unsubstantiated statements, and careless about the names of those he quotes and in his proofreading. Thus *empyema* is repeatedly "empyemia." And since when did the fallopian tube lead from the pharynx to the ear?

parts of Yugoslavia shows that the percentage of small holdings increased by ten from 1850 to 1936. In the period before the land reform was carried out this increase was even larger. With the growth of the rural population the number of the land-hungry peasants increased from year to year. The only means of relief was to reclaim the land and to enlarge the area for cultivation. As this work had generally not been undertaken on a large scale, there began a rural exodus and emigration to overseas countries and to newly industrialized regions. As emigration became more and more difficult during the last two decades, and more recently became practically impossible, distress in a large number of rural countries has even deepened.

In the past century urbanization and industrialization have gradually taken place in western European countries. The German urban population in 1871 was 14,800,000 and the rural population 26,300,000. In 1910 the urban population amounted to 39,000,000 and the rural to 25,900,000. In England in 1851 half the population lived in the cities and half in rural districts. Eighty years later, only 20 per cent of the population inhabited rural areas. In Belgium the number of the persons actively engaged in agriculture has decreased considerably in recent decades—from 25 per cent of the total population in 1846 to 8.2 per cent in 1930. In France from 1921 to 1931 the rural population decreased by 15 per cent. An urban and industrial Europe has come into existence.

The following facts give a picture of the agrarian situation in countries in which a large part of the population is engaged in agriculture.

In Poland there are 3,300,000 farms, the size of which varies widely. According to the census of 1921, two thirds of these farms were under ten acres and occupied only 25 per cent of the total arable land, while 19,000 farms were over 200 acres and occupied 27 per cent of the arable land.

In Yugoslavia, of 15,000,000 inhabitants 11,500,000 make their living from agriculture. Ninety-five per cent of all peasant families possess less than half and 5 per cent a little over half of the area under cultivation. Almost 20 per cent of the rural population possess no land at all, their income being derived from agricultural labor. Bulgaria is also a land of small farms. About 65 per cent of the land holdings are from five to twelve acres, occupying altogether six tenths of the arable land.

In Hungary, according to the 1930 census, 1644 land proprietors had holdings larger than a thousand acres, 10.1 per cent of all proprietors owned 148 per cent of the land and 779,105 proprietors held not more than two and a half acres, while 59.9 per cent of all proprietors owned only 4.3 per

cent of the total arable land. The number of laborers who were entirely landless amounted to a quarter of the total population. One third of them possessed their own cottages with small gardens. They earned low wages, which were in general below those earned before the World War. According to recent data, 55 per cent of the agricultural laborers were unemployed in the winter months of 1932-33, the average length of employment was 130 days, or barely 45 per cent of the potential annual working time. About 500,000 of these workers were not even employed during the summer.

In Roumania, 2,500,000 of the 3,300,000 farms comprise holdings below ten acres.

In Italy, one quarter of all the farms contain about one acre, 2,760,000 farms below eight acres occupy eight million acres, and 1596 large holdings comprise an area of ten million acres of arable land.

In Spain, the landed aristocracy, representing only 1 per cent of the total population, possesses more than half the total area of cultivable land. Three years ago, 3,000,000 of the 5,000,000 families engaged in agriculture possessed so little and so poor land that their standard of life was no better than that of the agricultural laborers. The large estates were worked by these landless laborers, whose earnings were very low.

In Far Eastern countries also, the rural situation is disquieting. The rural distress in India is shown by the rapid increase of domestic servants recruited from the agricultural population—from 2,500,000 to 11,000,000 between 1921 and 1931. In the Punjab over 55 per cent of the cultivators till less than five acres. This amount is not higher in other parts of India. The Punjab is called the land of peasant proprietors, but about 60 per cent of the land is cultivated by tenants paying cash or crop rents. In the United Provinces and in Bengal this proportion is even higher. It is estimated that in the United Provinces about 56 per cent of all tenants and peasant proprietors possess undersized holdings. In the central plains of Siam 36 per cent of the farmers possess no land, in the north 27 per cent, in the south 14 per cent and in the northeast 15 per cent. In the most fertile irrigation districts nearly all the families are tenants. In China, big land proprietors, absentee landlords and officials, forming only 10 per cent of the population possess more than half the land under cultivation, and poor peasants tenants and agricultural laborers forming 65 per cent of the population possess only 15 per cent. A survey undertaken in some of the eastern and southern provinces showed an average holding of less than one to one and a half acres. In one of the

registered deaths were attended by a physician during the illness, in the urban districts this percentage was as high as 32. In the rural areas 89 out of 100 infant deaths were not seen by a physician, in the urban districts 48. Out of 8273 physicians registered at the Roumanian Chamber of Physicians, 7010 resided permanently in the cities, and 1263 in the villages. There was one physician for 508 inhabitants in urban districts and one for 12,297 in rural districts. In Bulgaria at the end of 1936 there were 2719 physicians. Of this number 579 lived in the villages and 2140 in the cities. Not more than 20 deliveries out of 100 were assisted by a trained midwife. In Yugoslavia the situation is very similar. Of a little over 5500 physicians, only 800 are working in rural areas. In Austria more than half the physicians reside in Vienna—one for every 373 inhabitants, but in the province of Burgenland, which has the most rural territory of all the Austrian provinces, there is one physician for 2325 persons. The number of Hungarian physicians amounts to 10,306, of whom 4543 reside in Budapest. The ratio for Budapest is one physician for 219 inhabitants, and in the villages one for 1730. There are at the present time not more than 3200 medical men in Turkey, with a population of over 16,000,000, and these are located mostly in the larger cities—1000 in Istanbul alone. In Greece there are about 6500 physicians, of whom 1800 reside in Athens-Piraeus, with a population of slightly over 800,000. Czechoslovakian industrial areas are provided with better health services than are the typical rural districts. In the Soviet Union the five-year plans have provided an increasing number of physicians and health institutions in the villages, but their number is insufficient. The status of the health services in the large and predominantly rural countries of the Far East is surprisingly inadequate. In China there are less than 10,000 physicians for more than 400,000,000 inhabitants.

Generally speaking, social security for the farming population does not exist. For the workers engaged in industry proper a series of social insurance schemes have been enacted, for the workers engaged in agricultural labor this has been done only on a limited scale. The population of the urban and industrial districts is not only benefiting from the services organized for the treatment of the sick and for the prevention of disease by social security schemes, but is also taking a larger share in the social and health services organized and maintained by public funds.

It is difficult to estimate the rural population of the world, because changes are occurring in the composition of the population in general. There

has been a large rural exodus in almost every country. The growth and rapid development of urban districts have been striking. In general the percentage of the rural population has decreased. Still, of the 2 billion people in the world, at least 1½ billion are living in rural districts, mainly engaged in agriculture and home industries.

This agricultural population has a long history. The tillers of the soil made their own history, which influenced the events of the world. Their social position underwent three most important influences: that of outright slavery, that of serfdom, and, beginning several decades ago, that of personal freedom. In the vast area in which the rural population lives there still exist conditions which make life hard and even insupportable.

For centuries, farmers have been fighting for the possession of their own land. This struggle is still under way. The Roman Empire was weakened by agrarian revolts. The uprisings of the farmers which have occurred in almost every century were the consequences of social and economic unrest. In the period from 1789 to 1870, the agrarian revolution in European countries gave peasants freedom but left them still economically dependent. In the period after the Franco-Prussian war, in most European countries land reforms were carried out. The large holdings were expropriated and divided among landless peasants and those owning small land holdings. New settlements were established for the former on the large holdings previously belonging to wealthy landlords. In the Far East, with the largest rural population in the world, amounting to nearly 1 billion, the social and economic status of the peasantry has not changed materially, being still semi-feudal in character. In China, rural distress caused agrarian revolts over a large part of its enormous area and resulted in the loss of millions of lives. In India, the second largest rural country, there still prevail conditions which are keeping farmers in extreme poverty. In Japan there occurred an impressive improvement in the cities and a large number of industrial establishments were built up, but the farming population has remained to work the land, which for the most part does not belong to them.

In Europe, after the great reforms in the nineteenth century land could be conveyed with freedom, and family ties were weakened. This has produced a phenomenon known as the pulverization of holdings. The process can be shown by a few examples. In Hungary small holdings, those under five acres, numbered little over 22,000 in 1851. The total rose to over 1,000,000 fifty years later. In the same period the number of agricultural workers doubled. A survey made in some

vestigations and activities. There are still millions of human beings whose health has never been properly cared for. There are still very many physicians graduated from the best medical schools with inadequate knowledge of the importance of rural health problems and rural conditions as well as the enormous possibilities for health work in rural areas.

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The social side of medicine should not be neglected. This applies particularly to rural areas where social and economic conditions influence the whole rural life. This side of medicine is concerned with the problems of social ills and their origins and of social medicine. A rural health worker should bear in mind these aspects of medicine.

The social ills of rural areas are concerned with a large group of social problems of a medical kind such as bad housing, social diseases and malnutrition, which cannot be properly understood until their connection with social conditions is realized. Such investigations cannot be conducted in laboratories alone, but involve probing into every smallest part of the people's life and the closest scrutiny of the habits and customs and of the particular sections of the community.

The practice of social protection and prevention are showing ever more clearly that the medical man must make use of social science and that an acquaintance with it is essential to the success of his work. This leads to a change of approach in medical work, in this sense, that the physician applies his learning to the people as a whole, thus extending his knowledge and becoming a physician of the whole community. With the experience thus gained and the skill developed by practice, the medical man learns to feel the pulse, not merely of the single patient but of the nation as a whole, to study pathologic phenomena, not only in the lecture rooms and laboratories of institutes and in hospitals but on the body of whole sections of society, and indeed of the nation as a whole.

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The problems of public health do not fall exclusively within the province of the activities of a medical man, for health is our common heritage. The people's minds must be prepared for the measures to be applied, so that they can understand them and contribute to their enforcement. A law, however excellent, cannot be properly carried out, can yield only very poor results, if it finds no support among the people. This conception of education as a part of preparatory work for health activities shows most clearly how the physician should be a teacher of the people, indeed, he should make the greatest possible use of education as the best and surest way to success.

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It is usually assumed that the peasant is primitive and conservative, and that in his case health work encounters great difficulties. This conception, however, is due only to insufficient knowledge of the peasant's life. Our training usually takes us far from ordinary rural life, even in the case of persons of peasant origin. Peasant life nevertheless contains all the elements required for every form of progress. Generally speaking people have not bothered much about the peasant, as he is always looked upon as a permanent source of new life and reinvigoration in every nation. Yet in the villages, among the peasants, spiritual life can be found in abundance by those who would seek it out.

Are not the famous national songs and costumes the best indication of an exceptional spiritual life? Have not many famous men sprung straight from the peasantry? Sensitive to many fine features of peasant life, writers of genius have described them in some of the great masterpieces of literature. My happiest memories are those of life among the peasants. During my last period of

most fertile provinces in the south, two thirds of the farmers were living on one third of the land. In the most densely populated area of China, south of the Yellow River, tenancy is the most common form of land tenure. On the average, the tenant farmer pays about one half the proceeds from his crop to the land proprietors. In rural Japan feudal conditions still prevail. Sixteen per cent of the cultivable land is in the hands of the big landlords. With very few exceptions they rent their land to the poor and landless farmers. Half the total number of land holdings are composed of farms averaging less than two and a half acres in extent and comprise a little over 8 per cent of the total area under cultivation. The same area is owned by the big landlords, who possess over 120 acres each, but the number of their holdings amounts to only 0.1 per cent of the total. Of every 100 farmers, 74 are tenants or part-tenants and small owners.

The history and influence of the large landed properties or haciendas on rural life in Central and South American countries is too well known to be described here. The distress of the peasantry and agricultural workers caused by them is common knowledge, as are the resulting disturbances, which affected the whole rural life of some states. Of this, Mexico is an example. There are very large holdings amounting sometimes to two hundred and fifty thousand acres. The land is cultivated by the workers, who are bound to haciendas. This system has left some 5,000,000 of the population without agricultural holdings. They are laborers on the large farms, earning very low wages. In Chile the large estates of over two thousand acres, 18 per cent of the total number, cover nearly 80 per cent of the arable land. The living conditions of the agricultural workers are deplorable.

The rural areas are supplying cities and industrial districts with cheap labor and foodstuffs. The standard of life in the urban and industrial regions has improved very rapidly, while progress in the rural districts has been very slow. A large amount of agricultural products are exported from rural countries, and this is sometimes considered as a sign of prosperity in these regions. A survey undertaken in several rural countries on the nutritional status of the population showed that there exists undernourishment among a large number of the rural population, and that agricultural products are exported from rural countries without consideration of the nutritional requirements of the people. The reasons are purely commercial. The industrial products imported into the rural countries in exchange serve mainly the urban population and industrial establishments, from which

the farming population derives comparatively very small benefit. To cover their money requirements the farmers owning small holdings are usually compelled to sell the best products of their farms to the town people. Thus they are helping the cities and industry, themselves remaining far in the rear in regard to sanitation, housing, health and general education.

The unfavorable social and economic conditions of a very large part of the rural population, which have been pointed out here only in a general way, were followed by other phenomena such as illiteracy, illness, a high general and infant death rate, poverty, unrest and migration, the time allowed for this lecture is too limited to permit describing them in every detail.

* * *

When I was reviewing the rural conditions all over the world I thought about the rural health workers who are confronted with this situation. I am thinking now about medical officers who have initiated and are directing and stimulating health work in rural areas. The primary duty of a physician in a rural district was for a long time considered to be to serve as a helper to the sick. My own experiences have led me to believe that a health worker in a rural country must go much farther, and that his service must be connected with a scheme of general rural reform. His work when isolated is bound to fail. After working for some years in my native country and in China I came to the conclusion that successful health work is not possible in areas where the standard of living falls below the level of tolerable existence. The removal of social grievances, such as the sense of exploitation by others, is of the greatest importance. For social and health services depend for their success on the co-operation of the people, and this will only be given by a population which is reasonably optimistic concerning the future, and which is willing to give at least qualified acceptance of the social order.

After these general remarks I should like to make some observations in regard to the role of a physician in a rural country. I am thinking here mainly about the health officer, whose duty is to lead and to create. Obviously he is confronted with a much more difficult task than is a medical officer of an urban or industrial area. The rural conditions are still not sufficiently known, and for this reason the work of such a health officer is more difficult and cannot always be carried out on the usual pattern. In rural areas there is plenty of room for new starts and for very illuminating studies. The vast rural districts, which have never been properly covered by medical men, give a special opportunity for a wide field of health in-

vestigations and activities. There are still millions of human beings whose health has never been properly cared for. There are still very many physicians graduated from the best medical schools with inadequate knowledge of the importance of rural health problems and rural conditions as well as the enormous possibilities for health work in rural areas.

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activity my deepest impressions were those gained during the days I spent among the Chinese peasantry. The peasants in Yugoslavia have shown an extraordinary strength in their struggle for a better life. The *Croatian peasants are organizing* themselves socially and economically, preparing a basis for a better future. In their houses have been born writers who are active in every branch of public life. There is everywhere a strong movement among the peasants all over the world.

Thus a closer acquaintance with the peasant and a detailed study of conditions in rural districts are necessary before a plan of work can be mapped out. The peasant represents by far the largest component of the population in most countries, yet we know little and learn less about peasant life. Physicians often discuss the great incidence of mortality and disease among the peasantry, but these questions are not studied so thoroughly as they should be, particularly in the light of this consideration that health questions in rural districts can hardly be undertaken without a knowledge of general peasant standards.

Applied hygiene has before it a wide field of research into cultural, social, economic and health conditions in the rural environment. Some investigations have already been made on these lines in some countries, but they are isolated and disconnected in character. Moreover, the school and the home, manners and customs, cannot be separated from health. The physician should make it his first business to familiarize himself with peasant life from every angle, otherwise he will scarcely be in a position to organize appropriate health protection. The field of work must be known before systematic labor can begin.

Education is one of the most difficult problems in rural districts, but without it no progress in health work can be achieved. This work is sometimes regarded as an easy matter, but it calls for great skill, and requires a thorough knowledge of the region and of the people's minds. Overelaborate popular health education, undertaken without suitable preparation or a correct knowledge of conditions of life in the country, can occasionally do more harm than good. The educational activity of the village physician is necessary, if only to secure the collaboration of the population in health matters. As has already been pointed out, the whole population must participate in general health activities, for only thus can health-consciousness and the desire for health become general. The need for general collaboration must be particularly stressed in these times of economic depression, the health machinery in country districts can be planned by experts in the light of the latest experience and knowledge, but the practical work

must have the support of the population, and institutions for the protection of health must be set up by their help. Nothing is easier than to collaborate with peasants in the right way, they have great *resources of common sense and understanding, courage and strength*.

If the peasant in his struggle for existence has opened the wide spaces of the earth and drawn from them with his own hands the natural products on which the great cities live and flourish, why should he not sink wells, build water mains and erect health institutions? In the course of my long experience I have always found it easy to secure this co-operation, and I am more than ever convinced that the peasant is the best collaborator in health matters.

The most efficient method of health education in rural districts is the establishment of health activities, from which a peasant derives a direct benefit. Such a method is employed in Yugoslavia. The schools of public health and the institutes of hygiene are the centers of rural health activities. They advise farmers in sanitary engineering matters, conduct field work with their help, construct wells, latrines and manure pits and devise rehousing schemes on individual farms and establish central water supplies for whole villages. The schools and the institutes sometimes help with material for construction or with cheap loans, and the farmers contribute free labor. Such field work naturally stimulates an interest among the peasants. It creates a movement for better health among the rural population. In special classes during the winter the peasants are taught subjects of general educational value, but particularly those of agriculture, basic veterinary work, animal husbandry and health. The peasant women attend special courses in home economics, at which they are also instructed in health matters. Such methods show far better results than those of lecturing and exhibiting.

Nutrition in country districts has not been sufficiently investigated, so that here we are still largely on unexplored ground. Some people, thinking of the food the peasantry produce, wrongly assume that the peasant population has at all events enough to eat, but it is no exaggeration to affirm that in many districts the peasantry goes hungry, and that in even more districts the diet is unsuitable. Let the village physician devote a great deal of attention to this field of preventive medicine, for he can do much that is practical.

The value of the collaboration of the population in health matters has been sufficiently demonstrated. As has just been said, health work cannot be conducted actively in isolation, but must be accepted as part of the general work of rural reconstruction.

Purely medical activity cannot adequately promote the public health, since health problems depend for their solution on educational, economic and social factors which exert a decisive influence in most cases of disease. In country districts complete success by the physician is only to be expected if his activities are combined with those of the schoolteacher, the agricultural expert, the veterinary surgeon and the engineer.

The prevention and control of animal diseases is particularly important. The occurrence of infectious diseases among animals in rural areas is very high, and the losses are sometimes disastrous to rural economy, causing additional distress and poverty. The combined activity of a physician and veterinary surgeon in the village is very welcome to the farmers. They are most interested in health work if economic advantage follows it. In a remote part of China, in which animal husbandry plays an important role in rural life, the health services recently organized have been combined with services for the protection of animal health. The agricultural experts can introduce a better method of cultivation, and raise the yield per unit and thus also the standard of living. Engineers can reclaim, protect and increase the area of the arable land. Some data concerning Yugoslavia will clearly show to what extent such a work could improve the peasant life. In that country almost one quarter of the total population lives in regions which are too infertile to produce sufficient food. It is estimated that about one half this population must buy three quarters of the grain required for bread. The poverty in these regions sometimes prevents the people from buying necessary foodstuffs. Yet the area which is not under cultivation or not properly protected, and which could be made arable, is sufficiently large to provide the inhabitants with food, to raise the present low standard of living and to improve rural health conditions.

The chief professional help must come from the public-health nurse, but she can be of genuine as-

sistance only if she works on the same principles. She must act as a helper and teacher to the peasant population. It should be emphasized that to do her work aright and to be successful, the nurse must have been trained in the right way. Specialist training in various branches of health work would, however, be uneconomic and unsuitable in rural districts.

* * *

The tasks we have described naturally require a new outlook on the part of the medical profession, the spirit of the times and the even more manifest health needs of the peasant population compel us to think and work differently as time goes on.

There are several reasons for the maldistribution of physicians, medical aid and preventive work in the rural districts. Naturally the factors of economic nature are of primary importance. As long as a health worker cannot make an adequate living out of rural health work there will be a general lack of physicians in rural areas. Educational factors are also playing an important role. Villages are generally considered to be an unsuitable field for medical activities. Effective rural health work requires certain changes in medical education, particularly in regard to the social aspects of medicine. The other important factors should not be overlooked. The social and economic conditions of the rural population are in general such that they require a profound change. We reached the conclusion long ago that economics and health are interdependent, and this fact applies especially to rural areas. Successful health work can be attained only if it is correlated with other activities for the improvement of rural life. This naturally depends on a successful collaboration of the people and their free participation in public affairs. A rural health worker must therefore be a promoter of a social, political and economic peace. For these factors are fundamental requisites to the success of rural health work.

THE LOCALIZATION OF INTRACRANIAL LESIONS BY ELECTROENCEPHALOGRAPHY

DENIS WILLIAMS, M.D., M.R.C.P.,* LONDON, ENGLAND, AND FREDERIC A. GIBBS, M.D.†

BOSTON

NEUROSURGEONS have been greatly handicapped in their operative approach to intracranial lesions such as tumors and abscesses by difficulty in localizing the lesions. The most skillful neurological examination succeeds in doing so only in a minority of cases, and every clinical neurologist has from time to time found it impossible to decide whether symptoms of high intracranial pressure are caused by a frontal tumor or by an obstructive lesion of the posterior fossa. Study of the chemistry and hydrodynamics of the cerebrospinal fluid may facilitate the interpretation of clinical observations, and auxiliary methods employing radiography—encephalography, ventriculography and arteriography—have played an increasingly important part in the diagnosis of these lesions. The routine use of such radical diagnostic procedures in these cases reflects the difficulty which the clinical neurologist encounters in establishing accurate diagnoses.

The limitations of the available methods of investigation of neurologic disorders, especially those involving the central nervous system, render any additional diagnostic procedure of particular value to the clinician. Should this method enable the neurosurgeon to plan his operation with greater certainty and safety, it would have great practical value and earn an established place in clinical investigation.

That such a procedure is available was shown by Grey Walter⁴ in 1937, for he proved that electroencephalography affords a technic for the localization of intracranial lesions which has a high degree of accuracy without involving any discomfort or danger to the patient. He had observed³ that a focus of abnormally slow electrical waves collected from the intact cranium coincided with an area of cortical involvement by gliomatous tissue. Later⁴ he predicted the position of cortical damage in 12 cases in which tumor was subsequently seen. He showed that the slow waves occurred in poorly functioning cortex. In 26 cases with normal cortical potentials and in which a cerebral tumor had been suspected on clinical grounds, the subsequent investigation and progress of the cases showed that none had been present. It appeared, therefore,

that the method had very great practical application.

Walter developed his technic as a modification of that described by Adrian and Matthews.¹ With pads moistened in salt solution and placed on the scalp, he led off and amplified the minute changes in electrical potential—of the order of 1/50,000 of a volt—which are produced by the brain. He recorded these with a cathode ray oscillograph on moving bromide paper. With three pairs of electrodes connected to three separate amplifying and recording units, he was able, by noting the amount of abnormal activity in the three records and the phase relation of the abnormal slow waves, to determine which electrode was immediately over the focus of discharge (Fig 1). By moving the electrodes he determined the size and shape of the focus.

In order more fully to ascertain the value of this method to clinicians it seemed desirable that it should be tested independently on a random sample of patients under the conditions of ordinary hospital practice. This we have done, using the technic described by Walter, the only difference being that the oscillograph records were made with an ink-writing instead of with a cathode-ray oscillograph.

RESULTS

Most of the patients were referred from the Neurological and Neurosurgical Units of the Boston City Hospital. We are indebted to Dr. Donald Munro, Dr. Walter Wegner and Dr. Tracy Putnam for their co-operation in this investigation. A few patients in whom the diagnosis was obscure and to whom it was thought that electroencephalography might be of value were referred from other hospitals. So far as possible all the cases were examined in ignorance of the history or clinical findings, and clinical reports were not obtained until a report had been given on the electroencephalogram.

Eighty patients were examined, of whom 50 had abnormal cortical potentials with evidence of focal disturbance. Seventeen patients showed no cortical abnormality, and 13 had records characteristic of epilepsy, without any evidence of a constant focus of discharge of slow waves.

In 13 of the 50 cases with focus of abnormal

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discharge operation was not performed, and the clinical diagnosis was too indefinite to verify the accuracy of the observations. In these cases it was impossible to discover whether the focus corresponded with the position of the organic lesion.

In the remaining 37 cases verification of the position of the abnormality was possible. In 22 the lesion was seen at operation or autopsy, in 10 its position was established by unequivocal clinical findings, confirmed in 4 by radiological evidence, and in 5 a bone defect was present in the skull

cerebral tumor was made. She was discharged, having refused operation.

She was readmitted in December, 1937, with symptoms of high intracranial pressure, failing vision and generalized grand mal seizures. There was bilateral papilledema with a hemorrhage on the right. The pupils were irregular. There was slight weakness of the left side of the face and weakness and unsteadiness of the left arm. The right upper abdominal reflex was absent. X-rays of the skull showed thinning of the floor of the sella and erosion of the posterior clinoids, but no evidence of a local lesion. A diagnosis of right parietal tumor was made.

Electroencephalography showed 'irregular slow activity

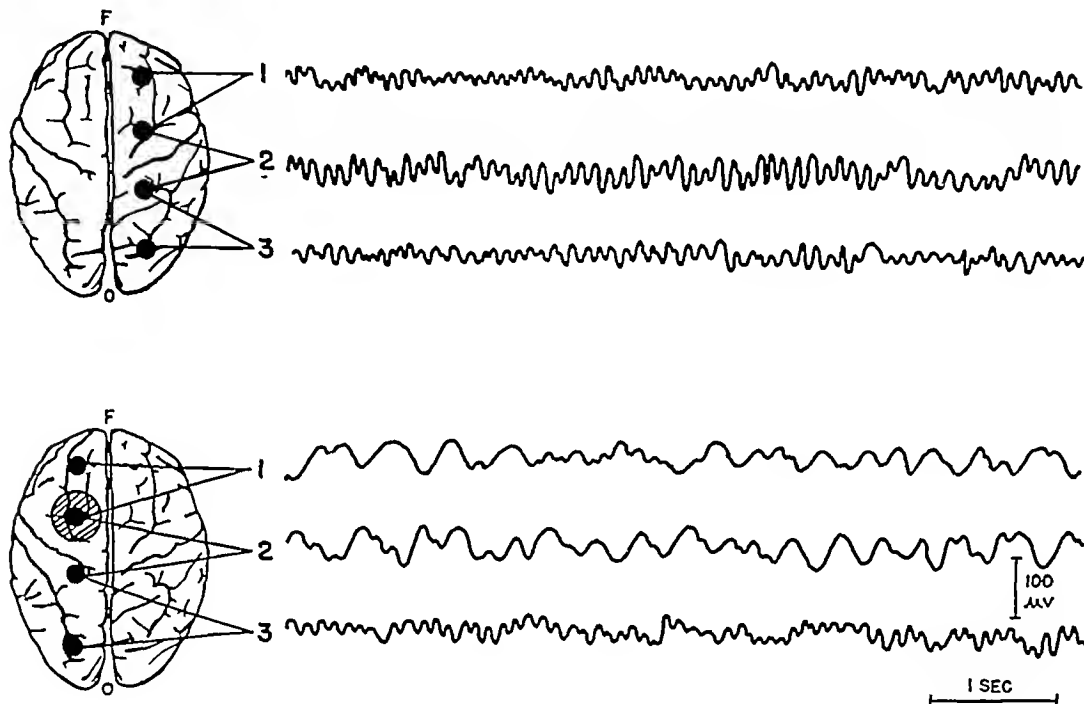


Figure 1 Records taken from the scalp of a patient with a left midparietal lesion. Three units are recording from the head. In the upper three tracings electrodes are placed in an anteroposterior position in the right hemisphere. A normal rhythm of about ten per second is seen. In the lower three tracings similar leads are used in the left hemisphere. Large slow waves of one or two per second are present in leads 1 and 2. The normal ten per-second rhythm is absent. The slow waves in lead 2 form a mirror image of those in lead 1, indicating that the focus of discharge is originating under the electrode which is common to leads 2 and 1.

as a result of previous trauma. In every one of these 37 cases the position of the single focus of abnormal discharge corresponded closely with the site of the organic lesion. For purposes of verification the 22 cases in which the cerebral lesion was seen were of greatest value. In these the correlation was striking. It would not be profitable to describe all the cases in detail. Instead, brief summaries illustrating the results in a few of them are recorded below.

CASE REPORTS

Case 1 F. G., a female aged 55, was admitted to the Boston City Hospital in May, 1935, complaining of left sided Jacksonian seizures. A diagnosis of right frontal

in all leads, with maximal and much more constant abnormal activity over the right parietal lobe. This is most marked rather low in the antero-parietal region. The diffuse waves may be due to increase in intracranial pressure.

At operation a right fronto-parietal osteoplastic flap was turned to center over the area of abnormal electrical discharge. A large meningioma was found in the center of the flap.

Case 2 J. R., a male aged 37, was admitted to the Boston City Hospital in October, 1937, having 1 year's history of a gradual onset of right sided sensory loss beginning in the hand and tongue and right sided focal seizures beginning in the fingers. Clinical examination showed slight signs of upper motor neurone damage in the right side, with moderate diminution of all forms of sensation of a hemiplegic type on that side. Encephalog

raphy showed slight convolitional atrophy in the right temporo-parietal region

By electroencephalography, "a normal rhythm was seen throughout, with the exception of a few low voltage slow waves emanating from the right temporo-occipital region, suggesting slight impairment of cortical activity in this region. If there is a lesion it is probably deep and is not involving the cortex directly." At operation an arterio-venous angioma was found in the posterior Sylvian region. A few veins presented at the surface, but it was obvious that most of the lesion lay beneath the surface of the cortex

Case 3 E. L., a male aged 63, was admitted to the Boston City Hospital in January, 1938. He had had headaches, nausea and vomiting for 2 months, diplopia for 1 month and drowsiness and mental deterioration for 2 weeks. On examination he was drowsy and apathetic, had a poor memory and was incontinent of urine. There was doubtful bilateral sixth nerve weakness, doubtful papilledema, and a suspicion of weakness on voluntary movement of the left side of the body. The tendon reflexes were equal, the right abdominal reflexes absent and the right plantar response equivocal. A tentative diagnosis of frontal tumor was made, the side being undetermined.

Electroencephalography showed 'very high voltage slow activity in the right frontal region extending as far back as the premotor area. There was slight abnormality on the left side, perhaps due to high intracranial pressure.' It was considered that there was very gross cortical dysfunction over the whole of the right frontal lobe. On ventriculography there was displacement of the right frontal horn, and at operation a hemorrhagic cyst the size of a tangerine was found in the right frontal pole 0.6 cm. below the surface. The overlying cortex was flattened and discolored.

The following case demonstrated the value of electroencephalography when clinical evidence of an intracranial lesion was lacking

Case 4 R. McK., a female aged 22, was admitted to the Boston City Hospital in October, 1937, having had frequent petit mal attacks for 2 years and four grand mal seizures in the last year. Except for a doubtful right sided onset, there were no localizing signs during the seizures. The only positive clinical signs were slight left sided motor weakness and a slight increase in the tendon jerks with an equivocal plantar response in the right. The visual fields were normal. X-rays of the skull showed no abnormality. A clinical diagnosis of 'epilepsy with a focus of undetermined nature in the left hemisphere' was made.

The report on the electroencephalogram was 'The left side appears normal. The right shows large waves with much abnormal activity centering in the posterior parietal region, with a central silent area. This abnormality is very widespread and suggests much cortical change.' From the type of disturbance it was thought that it might be due to a meningioma or some other destructive cortical lesion, and as the focus of discharge was so well marked, an encephalogram was strongly advised. This showed a large dilation of the temporal horn of the left ventricle, below the silent area localized by electroencephalography. A right parieto-occipital craniotomy was therefore performed, and a cyst 5 cm. in diameter was exposed in the right posterior parietal cortex. There was no overlying cortex, and the cyst communicated with the temporal horn of the right lateral ventricle, of which it was an enormous dilation. The cyst corresponded with the silent area in the abnormal discharge recorded electrically, and it

was seen that the occipital pole, from which normal waves had been obtained, was unaffected by the lesion

In 1 case where two lesions were found at autopsy, only the major lesion had been recognized by elec-

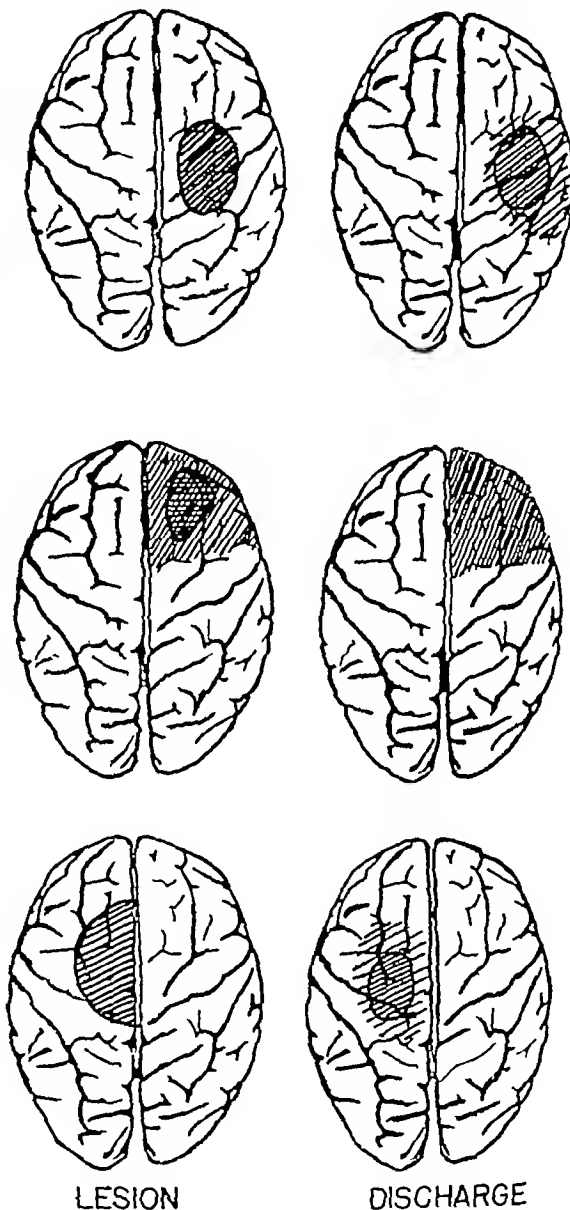


Figure 2 Charts of the cerebral hemispheres of 3 patients in whom the lesion was seen at operation. On the left is shown the position of the lesion as drawn by the neurosurgeon after the operation. On the right is the position of the focus of abnormal activity, as drawn on the report sheet given to the neurosurgeon before the operation

troencephalography. The patient was in deep coma and had high intracranial pressure at the time of investigation, and an enormous area of pathologic high-voltage discharge was maximal in the right temporo-parietal region. At autopsy, a large, wedge-shaped area of ischemic necrosis was found

to coincide with this discharge, and a meningioma was present on the outer and lower aspect of the left frontal lobe. Subsequent examination of the record showed that a subsidiary focus was present in this region also. In 2 of the cases presenting two foci of abnormality, the position of the greater disturbance only had been verified but the possibility of multiple foci was great.

In 6 cases where a lesion was subsequently seen to coincide with a focus of abnormal electrical discharge, it had been impossible to localize the lesion by clinical methods or by x-rays of the skull, three of these which subsequently came to autopsy, were considered to be in too precarious a condition to warrant encephalography. Electroencephalography was employed in all these cases. It was successful where all other available diagnostic methods had been found inadequate.

The lesions causing the abnormal discharge were diverse. They consisted of tumors (15 cases), abscesses (6 cases), traumatic lesions (6 cases), subdural hematomas (4 cases), porencephalic defects (2 cases), and Paget's disease of the skull causing localized cortical pressure, an idiopathic local cortical atrophy, Schilder's disease, and a tuberculoma (1 case each). This series of 37 cases, therefore, confirms Walter's observation that the slow waves emanate from abnormal cortex and not from the causal lesion. Foerster and Altenburger⁷ had previously shown that cerebral tumors were electrically inactive.

The negative cases in this investigation were also of interest, for in 7 a diagnosis of cerebral tumor or cerebral damage due to trauma was refuted by a normal electroencephalogram and the subsequent course of the cases suggested that this conclusion was correct. Total destruction or absence of cerebral cortex, unless gross, as in Case 4, may not be demonstrated by this method, especially if the remaining cortex is normal. This is illustrated by the following case.

Case 5 A G, a female aged 24, was admitted to the Boston City Hospital in September, 1937, with a recent bullet wound of the left occiput. The wound was explored the day after admission. The left occipital pole was lacerated, and fragments of bullet and bone extended along a wide track into the lateral horn of the left ventricle. All damaged brain tissue was excised, and a clean cerebral defect about 2 cm in diameter remained in the left occipital lobe. When discharged from the hospital the patient was well except for a complete right homonymous hemianopia.

Electroencephalography performed 6 weeks after the operation did not disclose any abnormally slow activity from the left occiput.

It is therefore apparent that a cortical defect is not responsible per se for the abnormal frequencies recorded. When we correlate the types of activity

occurring in the neighborhood of cerebral lesions, it appears that abnormal slow waves are most evident in diffuse cortical lesions where prolonged cortical damage short of complete cell destruction is present. Such situations are found at the periphery of large meningiomas, in cortex which is being infiltrated by gliomas, in the edematous cortex overlying an abscess, and in progressive idiopathic cortical degeneration. Thus by correlating the frequency and amplitude of the pathologic waves with the position of the discharge and its extent, it is possible in some cases to surmise the nature of the lesion. When the type of electroencephalographic record is correlated with the history of the illness and the clinical manifestations of the lesion, the method may be of considerable value to the physician in assessing the nature as well as the position of the lesion.

It has been shown that many destructive cerebral lesions cause abnormally slow cortical waves. High intracranial pressure gives rise to similar slow waves which are widespread throughout the cortex. When hypertonic intravenous glucose saline is given, however, the generalized slow frequencies can be eliminated and an underlying focus of activity determined. In 1 case in this series with high intracranial pressure, after hypertonic glucose had been administered intravenously it was found that no local cortical discharge was associated with the high pressure. A clinical diagnosis had not previously been made, and as a result of the electroencephalographic report a posterior fossa decompression was performed and a tumor exposed. There is no evidence, however, that lesions in the posterior fossa can be localized by this method, and the depth of overlying tissue, combined with the difference in electrical behavior of the hind brain, makes the application of the method to such lesions of extremely doubtful value.

The results of this investigation of 80 cases confirm Walter's observation that in electroencephalography an adequate method for the localization of intracranial lesions is available.

SUMMARY

Eighty patients from a neurological and neurosurgical service suspected of intracranial lesions were investigated by electroencephalography, using a method described by Walter.

In 50 cases a focus of abnormal activity was found. In 37 of these the position of an organic lesion was established. In every verified case the position of the lesion coincided with the area of electrically abnormal cortex. In 1 case with two lesions, only the major lesion was demonstrated.

In 6 cases it had not been possible to localize the lesion, which was demonstrated by electroencephalography and subsequently exposed surgi-

cally, by any other method, and in 7 cases a negative diagnosis in the face of clinical evidence to the contrary was subsequently shown to be correct.

The results have been elaborated and their significance discussed. It is concluded that this technique is of considerable value in the diagnosis of intracranial lesions.

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OBSERVATIONS ON THE CONVULSANT TREATMENT OF SCHIZOPHRENIA WITH METRAZOL

A Report of Seven Cases

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WITHIN the last few years there has been added to the armamentarium of the clinical psychiatrist the irritant or convulsant treatment of psychosis, particularly of schizophrenia. This form of treatment was first proposed by von Meduna,⁶ and is now being carried out in an increasing number of clinics in America and abroad. It is the purpose of this report to summarize the principal features of this treatment, and its application in 7 patients with schizophrenia, for it is in the latter disease that it has found its most extensive and promising application.

The treatment consists essentially of the induction of a series of convulsive seizures by the use of drugs, particularly metrazol, in dosages appropriate to the individual case. Although at first sight such treatment appears somewhat heroic, its worth as shown by the present data cannot be gainsaid, and to date very few ill effects have been reported.[†]

From data reported by various investigators, considerable optimism with respect to this form of treatment has been aroused. In von Meduna's⁶ series of 110 patients, 54 patients underwent remissions and 56 remained unchanged. In Wahlmann's¹⁰ series of 20 patients (including one manic-depressive who recovered), there occurred remissions in 8 patients and no change in 12. In Friedman's² series of 40 patients, 32 improved or had remissions. Nyirö⁷ observed improvement or complete remission in 13 of 24 patients. Scheuhammer and Wissgott⁸ have reported a series of 41 patients, 30 of

whom have completed the course of treatment, in 13 cases complete or almost complete remissions were obtained. The results were best in the catatonic and paranoid-hallucinatory patients and worst in the hebephrenic.

These writers consider the duration of the disease to be of definite prognostic significance. In 13 patients in whom the disease had lasted for one and a half years or less, the remission rate was 69 per cent, whereas in the 17 other patients, in whom the disease had been of longer duration, only 4 remissions were obtained. Of the patients with remissions, 5 have been continuously well for four or five months. Von Meduna⁶ maintains that in patients who have been ill not more than six months the remission rate is from 80 to 90 per cent, this rate falls rapidly after the illness has been present for a year, and in cases of longer than four years' duration is practically nil. Sorger and Hofmann,⁹ in their series of 100 patients, have reported the following data, which also indicate clearly that the prognosis with this treatment is better the shorter the duration of the disease:

DURATION OF DISEASE	NO. OF CASES	REMISIONS		UNCHANGED	
		No.	%	No.	%
Acute (up to ½ yr.)	38	29	76	9	24
Subacute (up to 1 yr.)	13	7	54	6	46
Chronic (over 1 yr.)	49	13	27	36	73

It thus would appear that, even allowing for a certain tendency to spontaneous improvement, treatment by metrazol is of material advantage.

RATIONALE

On the basis of reports by various psychiatrists that schizophrenia and epilepsy are rarely if ever found together, and also that patients with frequent epileptic fits who had schizophrenic features recovered rapidly, von Meduna⁶ has postulated a biologic antagonism between these two disease processes. He has therefore maintained that by in-

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†In a series of 110 patients observed for a total of about 1000 convulsions, von Meduna⁶ has reported cases in which the only injuries were a dislocated arm and in two instances a dislocated jaw. Only 4 fatalities have been reported to date [Kennedy].¹ 1 of these patients had aortic regurgitation and 1 a hypernephroma (both clinically diagnosable); the other 2 deaths were due to pulmonary embolism. Kennedy states the fatality rate to be 0.3 per cent.

ducing epileptic attacks in schizophrenic patients a change in the chemical, humoral, hematologic and other aspects of the organism is brought about and a possibility given for a remission. The soundness of the clinical basis for such an antagonism is doubtful, since most clinicians have observed rare epileptic schizophrenics and schizophrenic epileptics.* But it has been shown by many investigators, notably Hoskins and Langfeldt, that there are various biochemical and metabolic anomalies which characterize the schizophrenic patient observations which Friedman,² who introduced the convulsion treatment in America, considers to be indicative of a type of sluggishness in the somatic economy. Friedman postulates "a functional barrier to facile absorption or assimilation of nutritive elements set up in the brain," and considers that therapy should be directed against this barrier in order that normal nutritive mechanisms may be reinstated, "thus providing an unblocked pathway for normal mental functions." With the use of metrazol, which is a medullary stimulant, he postulates that the vital centers are affected and that the supposedly sluggish vegetative nervous system is mobilized to action.

The question of whether convulsions are necessary for optimal results has been raised by Friedman, who points to the frequent occurrence of petit-mal and delirious reactions as equivalents of the usual grand-mal seizures, he is of the opinion that both delirious reactions and convulsive seizures are necessary for the best results.

It appears that the drugs employed to date are not specific, and that their importance consists entirely in their convulsant properties. For this reason the technic adopted by various investigators has been directed toward the establishment of as low a convulsive threshold as possible in order that dosages may be kept minimal. To this end Friedman,² for example, has advocated alkalinization and hydration for the establishment of a low convulsive threshold. He has suggested that the patient be placed on an alkaline diet for about a week preceding treatment and throughout its course, sodium bicarbonate, 2 to 3 tablespoonfuls daily, or its equivalent, is also administered, the litmus reaction of the urine is used as a check. In addition, the fluid intake is kept at a minimum of at least 2000 cc. per day. Camphor is then administered for at least three weeks, being injected intramuscularly in 25 per cent oily solution, twice daily, with an initial dose of 4 gm of amorphous camphor, increased 1 gm per day. Following this period, treatment with metrazol by intravenous injection is begun, the initial dose is usually 5 cc

of 10 per cent solution, increased by 1-cc. amounts to the dosage necessary to produce convulsions.

METRAZOL

Metrazol (pentamethylenetetrazol)* is an analeptic drug which is used fairly extensively in general clinical practice as a vasomotor and respiratory stimulant. It tends to raise the blood pressure in conditions of depressed circulation, and to increase the depth of respiration. It is generally used in 10 per cent aqueous solutions. In doses larger than 3 or 4 cc it becomes a convulsant, especially when administered rapidly. Since it is absorbed very quickly it enjoys an obvious advantage over camphor-in-oil solutions, which are administered intramuscularly and reactions to which may be delayed for as long as several hours.

The nature of the effect of metrazol on the nervous system is not clear. From the standpoint of brain function it appears that the vascular system is of primary importance and that the action of the drug is one of progressive involvement of successively higher centers, namely the carotid sinus, medulla, basal ganglia and cerebrum. The significance of the vascular system is indicated in a report by Esser and Kühn,¹ in a postmortem examination of a twenty-two-year-old laboratory assistant who committed suicide by drinking 100 cc. of 10 per cent metrazol solution they found, in addition to lesions in various organs of the body (notably the liver and heart), that the brain was hyperemic with beginning thrombotic processes, the glia and ganglion cells being apparently unaffected. The patient had died in convulsions within an hour. Esser and Kühn believed that the lesions in the heart and brain were more extensive than the amount of metrazol recovered in these tissues warranted.

TECHNIC

Friedman² has listed several general contraindications for the selection of cases for metrazol injection in which the clinical evidence is not clear. These are: evidence of cardiovascular disease, acute febrile infections, menstruation, abnormalities of laboratory findings, and a history of head trauma with subsequent unconsciousness.

The procedures outlined by Friedman with respect to alkalinization, hydration and camphor administration have not been followed by the present investigator. It was felt that these features of procedure represented elaborations which might well be postponed until the efficacy of the simplest procedure could be established. Hence this report deals with the effectiveness of metrazol adminis-

*A critique of the schizophrenia-epilepsy relation has recently been made by Niro.

*The chemical and pharmacologic properties of metrazol have recently been admirably reviewed by Kennedy.

tration only, no other unusual procedures having been carried out

In the observations to be reported, the course of metrazol treatments was begun with 3 cc of a 10 per cent solution. All injections were intravenous. The dosage was increased by 1-cc amounts only when a convulsion of the grand-mal type had not been induced at the lower dosage. Friedman,² following von Meduna,⁶ has established twenty to thirty seizures as the course of treatment, and both maintain that even after recovery occurs two or three more seizures should be induced, injections were given twice weekly. These suggestions regarding duration of the course and frequency of injections seem to be quite arbitrary.

With 1 exception (Case 7), injections were administered three times per week. There is some evidence (Case 7) that beneficial effects may be derived when the drug is administered daily. It is possible that even more frequent administration may be feasible.

CLINICAL OBSERVATIONS*

The sequence of events in a grand-mal seizure induced by convulsive doses of metrazol is as follows:

1 Immediately following the injection there is a latent period which lasts from four to ten seconds.

2 There then frequently ensues a short interval of gasping or coughing, followed by one usually lasting not more than ten seconds during which the patient makes thrashing movements and flails his arms and legs about, his facial expression closely resembling terror. The face is flushed, the pupils become widely dilated, and the eyes stare wildly. In some patients this phase is so brief that it is scarcely distinguishable from the succeeding one, but in others it may last as long as fifteen seconds.

3 This stage is characterized by increasingly rapid, generalized clonic twitches. The pulse rate becomes rapid and the systolic blood pressure is elevated. Although it was felt clinically that the muscular twitches began in the face, examination of our cinematographic records revealed that they began in all muscles of the body simultaneously. Furthermore, it was observed that the twitches occurred on both sides of the body, also simultaneously. The eyeballs jerk upwards, the lids often close tightly, and the pupils remain dilated and do not react to light. Cyanosis becomes more and more marked, and the face and

tongue may become livid. Spontaneous ejaculation, without erection, occurs in most patients, often early in this phase. The thorax is fixed, and for the duration of this phase and the next the patient is apneic. This stage lasts from five to twenty seconds.

4 At this stage the so-called "tonic" phase supervenes. It is usually the most prolonged phase of the seizure, and lasts from fifteen to forty seconds. Characteristically the picture is one of carpopedal spasm. The jaw is opened, the head is hyperextended, the eyeballs are rolled upward and sometimes outward and the shoulders are adducted. Corneal reflexes are absent. The hands, in the position of tetany, are often held just over the genitalia, or may be extended outward. The legs are extended and partially internally rotated. The great toes are maintained in extension and the small toes in flexion. There is a tendency toward opisthotonos and sometimes orthotonus. The cyanosis during this period is extreme.

5 At this stage the clonic phase again supervenes, lasting for a very short interval, the shortest of all. Then quite suddenly all clonic movements disappear. There is a cessation of movement in all muscles of the body, on both sides simultaneously. The patient takes a deep breath, signaling the end of the period of apnea. The pupils often contract with the onset of breathing, but may redilate or manifest hippus. The breathing becomes stertorous, salivation is very marked. The cyanosis rapidly disappears.

6 The patient now is seen to be in a stuporous state. Occasional spontaneous clonic twitches may be noted. Myotatic irritability may be marked. The deep reflexes are usually absent or sluggish. There remains some cyanosis, particularly of the lips and ears. In only 1 of our patients was vesical incontinence noted, and this occurred only infrequently. Rectal incontinence has not been noted. These observations concerning sphincter control are in disagreement with those noted by other writers, who report vesical and rectal incontinence as quite frequent. This may be due to the fact that previous overhydration had been a feature of their experimental regimen. The stuporous state lasts for a variable period, sometimes as long as ten minutes, after which there appears to be a gradual return to the former state of consciousness, lasting fifteen or twenty minutes. During the early part of this stuporous phase the patient is completely relaxed, he does not answer questions or obey commands. Sleep may supervene. As time goes on, however, he becomes more and more re-

*The nature of the convulsions was studied cinematographically in collaboration with Dr. Joseph M. Looney, director of laboratories, Worcester State Hospital.

sponsive* An invariable feature during this phase is retrograde amnesia. This symptom disappears within an hour of the beginning of the seizure. However, the amnesia for the convulsion itself is persistent. Some patients tell of various peculiar experiences just after the injection, such as "The room rotates around and around"—"I see a hundred people that look like you"—"There's a terrific cracking in my head"—"I see black." These experiences are apparently quite frightening and may account, at least to some extent, for the great fear many patients have of the treatment.

It seems worth while to emphasize the probable significance of this fear. After two or three injections some of the patients begin to complain bitterly of the treatment and offer considerable resistance. They say that they are sure they are in no need of it, that it does them harm of one sort or another, that it makes them feel that they are going to die. In some clinics an attempt is being made to overcome these preinjection states of agitation by narcosis, especially with insulin, a suggestion first made by Klaesi in 1937†.

The foregoing description pertains to the grand mal type of seizure. Following about one fourth to one third of the injections, seizures which appear to be of the nature of petit-mal, or of epileptic equivalents, occur. These take diverse forms. Usually they consist of more or less isolated twitches, which last a few seconds, usually involving the face and arms, or the patient's facial expression may merely become fixed and apprehensive. Sometimes he becomes quite excited and hyperactive, performing numerous bizarre movements, such as racing about the room, scratching his head or body, fighting or climbing about on the bed. Stupor apparently does not ensue. The patient has a persistent amnesia for this form of seizure also.

It is of interest that, unlike patients who have just had a true epileptic attack, our patients never complained of lameness or stiffness of the muscles. The reason for this may be inferred from our records: it seems clear that the muscular activity produced is not violent. Overflexion and over-

extension of the muscles, resulting in strained ligaments, apparently do not occur. An exception to this observation may exist in 1 of our patients (Case 1), who dislocated both shoulders.

CASE REPORTS

For purposes of this report 7 illustrated cases are cited. These patients were selected as fairly representative of schizophrenic patients usually found in state hospitals. They are of various types and have been ill for various periods of time.

Case 1 age 24 The onset of schizophrenia had been quite gradual over about 1 year, and was manifested by a change in personality. The patient had become quite irritable, complained of headaches, seemed discouraged, and said that he was a wreck. He began to talk foolishly. On the ward he was quiet but often moved about restlessly. There were numerous mannerisms of the eyes, mouth and hands. His speech was jerky and scattered, his mood shallow. He admitted having heard voices in the past. There were no frankly paranoid ideas.

Metrazol treatment was begun, but after three injections, the last of which was 5 cc., the patient dislocated his right shoulder during a seizure and treatment was discontinued. It was resumed after 6 weeks, but after two injections, the second of which was 4 cc., he dislocated his left shoulder and it was decided to discontinue treatment indefinitely. During the first course he had two seizures and during the second only one. His clinical condition remained unchanged.

Case 2 age 34 The patient was admitted in 1925, at the age of 22, and has since resided on the disturbed ward. The onset occurred some months previously, when he gave voice to various paranoid ideas and was obviously responding to auditory hallucinations. On admission he was restless and complained of various ideas of persecution. The course since admission was that of progressive deterioration, the patient eventually becoming almost entirely mute and presenting a picture of speech and general motor stereotypy. He waved his arms about and danced around the ward in a peculiar manner, making buzzing sounds, sometimes for hours at a time. Wet pack treatment and chemical sedation were frequently necessary.

Metrazol injections were begun and given in doses up to 7 cc. until twenty convulsions had been induced. The patient had two convulsions in doses up to 6 cc., but the remaining convulsions were induced with 7 cc. The clinical condition remained essentially unchanged except for a frank diminution of the stereotyped mannerisms and hyperactivity, which largely disappeared.

Case 3 age 18 Three years before admission the patient had become absentminded, uninterested and seclusive. He talked in a peculiar manner of dying, of mental telepathy and of general muscular weakness. On admission he admitted that he felt peculiar and heard voices. He was quite apathetic. He had been given a course of insulin treatment by Dr. Cameron with no striking change in his clinical condition.

Metrazol treatment was carried out for a course of twenty convulsions. The patient received 25 injections up to a maximum of 10 cc., six fits occurred at 7 cc. and six at 10 cc. No essential change in the clinical condition was observed.

Case 4 age 26 The onset of schizophrenia apparently

*The data on the nature of the return to the former state of consciousness will be reported separately. They offer some illumination of the problem of postconvulsive confusion.

†For Meduna* has observed that various blood and urinary changes occur. The former consisted in an increase of neutrophils and an increase of lymphocytes; the blood picture changes were greater in patients who underwent a remission. The acidity of the urine was increased (about 25 per cent) as were the ammonia (14 per cent) and the phosphates (10 per cent); the chlorides were reduced (25 per cent). These findings support his opinion that the seizures are epileptic. Sorger and Hofmann† reported that during the seizure and immediately after the eosinophils, monocytes and polymorphonuclear leukocytes decreased and the lymphocytes increased; after two or three hours the eosinophils disappeared and there was a decrease of monocytes and lymphocytes and an increase of polymorphonuclear leukocytes. The blood picture again became normal about six hours after the seizure. These men also report a rise of the blood sugar level immediately after the seizure, the maximum being reached after about thirty minutes, followed by a rapid fall to normal.

†The concomitant utilization of insulin induction also seems to lower the convulsive threshold; a smaller amount of metrazol therefore being sufficient. (See p. 2 Geer, and Strauss.)

occurred 3 years before admission, with persecutory delusions and bizarre visual and auditory hallucinations. A partial remission occurred for a few months, but the patient again became ill, with essentially the same clinical picture. On admission he was preoccupied, unco-operative, and disinclined to talk. He had numerous persecutory delusions and visual, auditory, and olfactory hallucinations. He was given a full course of insulin treatment by Dr. Cameron and manifested a partial remission which lasted several months, but again relapsed to his former clinical state.

Metrazol treatment was carried on until twenty convulsions had been induced. Twenty-three dosages were necessary, gradually increasing to 7 cc. per dose. The clinical condition improved markedly after the eighth seizure. The patient said that for the first time in years he felt quite normal. His speech became active and lively, but the voices, in the form of whispers, persisted. Some of the persecutory delusions also remained, but did not disturb the patient. This marked improvement persisted for about 3 weeks, during which treatment was continued. The patient then underwent a partial relapse. Although a fit had been originally induced with 3 cc., none was subsequently induced until 7 cc. was reached and the patient remained at that dosage. At a recent examination he complained that his memory was poor and thoughts 'stuck' in his mind. On the other hand he felt better than he had previously, except for the period of marked clinical improvement.

Case 5, age 24 This patient had for years been concerned with his state of health and had exaggerated his somatic complaints. About 3 years before admission he began to talk unceasingly of his health. He lost interest in everything else. He gave voice to many bizarre ideas, such as that the bones of his head were soggy and decayed, that his forehead and nose had sunk in, that his palate had fallen, and that his head expanded and contracted rhythmically, and that the bones in his chest were soft. On admission to the Worcester State Hospital he was quite emaciated, and referred constantly to his somatic complaints.

Metrazol treatment was carried out until a course of twenty convulsions had been completed. Twenty-five doses were necessary, at increasing levels to a maximum of 14 cc. When the course was about half complete the patient suddenly announced that he felt much better, but he again relapsed. From time to time over the ensuing weeks he denied all his somatic complaints for as long as a day or two at a time, but after the seventeenth convulsion his complaints entirely disappeared. Treatment was stopped after 20 seizures because the patient's improvement seemed to be quite permanent. He gained 8 lb. and seemed quite interested in returning home and finding a job. He was discharged in a complete remission.

Case 6, age 29 The patient had been a vagrant for many years and was admitted because he was actively hallucinated, talked to himself and seemed silly. On the ward he was markedly overactive, and dashed for the door in an excited manner. His speech was quite disjointed. It was necessary to keep him in seclusion for a year after admission because of his excitement and untidiness.

Metrazol treatment was carried on for eleven injections, during which the patient had six convulsions. A maximum dosage of 9 cc. was reached. The patient improved markedly, became quiet and co-operative and dressed himself, and it was possible to keep him on the ward, although he still dashes toward open doors, he is entirely manageable. Treatment was discontinued because

the patient's improvement was so marked that it was felt unwise to prolong it—a procedure which may be unjustified.

Case 7, age 28 Five months before admission the patient became seclusive and ate poorly. He expressed paranoid ideas and was actively hallucinated. On admission he was unco-operative and resistive, and soon thereafter became extremely excited. He was antagonistic and threatening and had to be kept in seclusion. Constant pack treatment was necessary. He refused to dress, was untidy and had to be tube fed. He became quite emaciated. The picture seemed to be one of an acute excitement with a very grave prognosis.

Four daily injections of metrazol were administered, and since he failed to react after one injection at 3 cc., the dosage was raised to 4 cc. to induce two of the three seizures. Immediately after the second seizure he asked for food for the first time in several months. After the third he again asked for food. The same day he became quiet and co-operative and thereafter dressed and fed himself. It was no longer necessary to keep him in seclusion. In the ensuing three weeks of hospitalization the patient appeared quite normal. Although on one occasion he complained of hearing voices at night, these hallucinations disappeared and the patient on discharge was entirely symptom free. He gained 25 lb. He referred to his previous illness as a nightmare, but beyond this said he could not remember or understand what had occurred.

The patients reported here, all male schizophrenics, had been ill for periods of from five months to about fifteen years. Following treatment, 3 patients remained unchanged, 3 improved—2 quite markedly—and 2 manifested complete remissions. The most dramatic recovery occurred in an excited patient who had been ill about six months, but recovery also occurred in a patient who had been ill for many years.

From this limited number of cases it is impossible to formulate any generalizations as to the prognosis under this form of therapy in terms of the duration of the disease. However, one may say roughly that the prognosis appears better in patients in whom the disease process is recent. And it would appear that the improvement rate, even in this generally unfavorable group of patients, is fairly high.

SUMMARY AND CONCLUSIONS

A brief review of the rationale and efficacy of the convulsant treatment of schizophrenia has been presented, and 7 cases of representative schizophrenics treated by this method are recorded. The simplest manner of administration of this therapeutic procedure, namely intravenous injection of metrazol over a period of time, has been described. The nature of the resulting grand-mal convulsion, from clinical and cinematographic observations, is described. The results of other investigators who have reported more extensive series are presented, from their data it seems

quite clear that the prognosis is better the earlier in the course of the disease process the treatment is begun

The question arises in this connection, as in all therapeutic procedures in schizophrenia, of the true worth of metrazol injection. Disappointment, often after long optimism, has been the rule. Probably final judgment must be reserved until a sufficiently large body of data has been placed on record and the permanence of improvement or complete remission has been established after a five to ten-year period. Strict comparisons with the spontaneous remission rate are essential. It seems from these preliminary data that the convulsant treatment of schizophrenia arouses considerable hope, and is therefore worthy of more extensive investigation. The theoretic basis for this form of treatment is still uncertain, and presents numerous problems. The psychologic factors involved, especially the fear of treatment that is induced in many patients, merit the most careful evaluation.

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SPONTANEOUS THYROID STORM ASSOCIATED WITH DIABETIC ACIDOSIS AND PARALYTIC ILEUS

Report of a Case With Autopsy Findings

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IN A search of the available literature I have been unable to find another case presenting spontaneous thyroid storm associated with diabetic acidosis and paralytic ileus. Hypoglycemic convulsions followed by pulmonary edema terminated the course in the patient reported herewith.

CASE REPORT

A 22-year-old American, white, married newspaper bundler (B. C. H. No. 875116) entered the hospital October 3, 1937, because of diarrhea and vomiting of 1 week's duration. His health prior to this time had been good. Except for a moderate degree of nervousness during the previous month, there were no significant facts in his social, family or past history.

Starting one week before entry the patient began to have attacks of diarrhea, with five to seven yellowish-brown watery movements daily. With them mild, cramp-like abdominal pain occurred. The stools were never clay-colored, contained no pus or blood and were not associated with tenesmus. Vomiting developed 3 days prior to entry and persisted, being most marked 5 to 30 minutes after meals. The vomitus contained, for the most part, undigested food, and the attacks were preceded by mild nausea.

Anorexia was marked and a weight loss of 15 lb was noted during this week. No icterus was apparent. In addition to these gastrointestinal symptoms, palpitation became annoying. The patient was nervous, restless and unable to sleep. He complained of sweating and of feeling warm, yet had no chills or chilliness. Nocturia, increasing to seven times, developed. Weakness prevented activity and forced continued rest in bed. For several days before entry the vision seemed blurred. Two days prior to admission a rash appeared on the face and chest.

On physical examination the patient was a small emaciated youth, rational but severely prostrated. He weighed approximately 130 lb. The hair distribution and texture, and the skull, ears, nose and throat were all normal. Both eyes were symmetrical and prominent to a moderate degree, and showed lid lag and poor convergence. A slight puffiness of the lids was noted. The pupils reacted to light and accommodation, and ophthalmic examination revealed a clear media and normal fundi. The tongue was dry and coated and exhibited no tremor. There was a marked acetone odor of the breath. The neck was not stiff, and the carotids pulsated strikingly. A generalized, pea-sized, non-tender adenopathy was accentuated by the degree of emaciation. The thyroid gland was not palpable, nor did it exhibit any nodules, bruits or thrills. The trachea was in the midline and there was no trace of tracheal tug. The lungs were resonant, the breath sounds normal, rales absent, and the respirations 32.

The heart was not enlarged, and on palpation revealed

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marked precordial activity. The aortic second sound was greater than that at the pulmonic area. No murmurs could be detected, and the heart sounds were loud and clear. The rate was 160, and the rhythm regular. Very loud pistol shot sounds were heard over all arteries, and the patient had a Corrigan pulse. The arteries were normal in size and consistence. A blood pressure of 360+/0 in both arms was recorded on several occasions. Unfortunately the spring type of sphygmomanometer was not checked with the mercury type.

The skin was warm but not moist. There was a sparse, discrete, maculopapular rash on the face and chest with lesions measuring 1 to 2 mm in diameter. The abdomen was tense but not distended or tender, and revealed no masses. The liver and spleen were not felt on repeated examinations. Tremor of the hands was absent, and the reflexes were active. The temperature on admission was 101°F.

On admission repeated urine examination showed a specific gravity of 1.025, no albumin, complete reduction for sugar and a 4+ acetone test, only occasional white and red cells appeared in the sediment. The fasting blood sugar was 217 mg, the nonprotein nitrogen 57 mg, and the carbon-dioxide combining power 22 vol per cent. Two blood cultures and one blood Hinton test were negative. The white-blood-cell count ranged between 15,000 and 19,000 with 98 per cent polymorphonuclears and 2 per cent lymphocytes. The blood smear was otherwise normal. The hemoglobin was 92 per cent and cholesterol 75 mg per cent. Two electrocardiograms showed sino-auricular tachycardia.

The patient was treated intravenously with saline solution containing 10 per cent glucose and 400 units of insulin during the first day. By the morning of the following day he was quieter and free of acetone, but still showing a red, sugar reduction in the urine. The blood pressure was now 170/85. The pulse rate ranged between 140 and 180, the respirations were 30 to 35, and the temperature was 100 to 102°F. Vomiting and diarrhea were not present.

On October 5 the patient began to hiccough and complained of mid-abdominal discomfort. Two hours later he had fecal vomiting for the first time, this persisted for half an hour, the patient lapsing into coma. The abdomen became rigid and level, flatness on percussion could be elicited in the flanks as well as in the midabdomen. The blood pressure was at a shock level, with the pulse at 180 and weak, and a cold, clammy skin. Gastric lavage was started and yielded 2300 cc. of fecal, fluid material, the clinical response was dramatic. The blood pressure rose to 110/40 as consciousness returned. Later that day it was 140/80. A Wangensteen apparatus was then set up to syphon off excessive gastrointestinal contents, it had to be left in place, because as rapidly as intravenous fluids were given, an almost proportional accumulation of fecal fluid appeared.

On October 4 and 5 the patient was given 10 min of Lugol's solution every four hours, and intravenous fluids were maintained almost constantly. On October 6, 50 min of this solution were added to each liter of normal saline and glucose given intravenously. The patient continued to become progressively irrational and lost weight rapidly.

On October 6 the nonprotein nitrogen was 87 mg, blood sugar 240 mg and chlorides 616 mg per cent. Acetone reappeared in the urine, glycosuria having persisted throughout the hospital stay. The skin was only mildly warm, and not flushed or dry. At no time did the temperature rise over 102°F, probably because of the intermittent acidosis present.

During October 7 and 8 the patient was drowsy, yet could be roused easily. On October 9 the blood sugar was 30 mg per cent, and concentrated glucose was given intravenously. Before much of this had been given, tonic and clonic convulsions occurred, followed by rapidly developing pulmonary edema and death.

Autopsy Report The essential findings 4½ hours post mortem were as follows. The thyroid was moderately enlarged and weighed 40 gm. Its external surface was brown and smooth. The cut surface was dark brown and granular, the granules being 0.2 to 0.3 cm in diameter and of a lighter color than the surrounding tissue. The cut surface of the lungs was red and crepitant, and small amounts of pink, frothy fluid could be expressed from all areas. The stomach contained several hundred cubic centimeters of black, foul smelling fluid. The gastric mucosa appeared dark red, and irregular, shallow ulcerations, 0.2 to 0.3 cm in diameter, were scattered throughout. The first two portions of the duodenum were distended, and its mucosa was gray. Scattered throughout the terminal portions of the ileum and ascending colon were areas 5 to 10 cm in width in which the mucosa was red yet contained no ulcerations. The liver weighed 1750 gm and showed no gross abnormality. The entire aorta appeared narrower than usual, and the arch of the thoracic aorta had a circumference of 4.5 cm. Scattered through the abdominal and thoracic aortas were small, yellow, atheromatous plaques.

The anatomical diagnoses were hypertrophy and hyperplasia of the thyroid gland, acute gastritis, early atherosclerosis of the thoracic and abdominal aortas.

Cultures of the heart's blood showed no growth.



Courtesy of Dr. G. Kenneth Mallory

Figure 1 A photomicrograph of medium power showing marked hyperplasia of thyroid gland

- A—an area of acini without colloid,
- B—papillary projections into acinus,
- C—columnar epithelium

Microscopic examination of the thyroid showed three distinct areas of marked hyperplasia. There were many acini without colloid, another area revealed large acini with marked papillary projections of their walls. In still another area the acini were lined with epithelium of a columnar type. Around a small, necrotic, cardiac muscle bundle there was a small focal accumulation of polymorphonuclear leukocytes. In the walls of the bronchi and immediately adjacent alveoli were collections of polymorphonuclear leukocytes and a few lymphocytes. The

spleen contained moderate amounts of phagocytosed hemoidin. There was extensive ulceration of the esophageal epithelium. The submucosa was diffusely infiltrated by large numbers of polymorphonuclear leukocytes and contained small deposits of fibrin and thrombosed blood vessels. There were large areas of extravasated red blood cells in muscular layers and diffuse infiltration of these layers by polymorphonuclear leukocytes. There was an ulceration of the gastric mucosa, and in this area the surface was composed of polymorphonuclear leukocytes, red blood cells, fibrin and necrotic tissue. There were large areas of interstitial hemorrhage in the submucosa, and scattered throughout were many polymorphonuclear leukocytes. Occasional polymorphonuclear leukocytes and histiocytes were noted in the muscular layers, and there was a small deposit of fibrin on the serosal surface. The interstitial pancreatic tissue showed small numbers of polymorphonuclear leukocytes. These cells were occasionally present in small masses around the islands. The liver appeared to be negative. Since no vacuoles were seen, glycogen and fat stains were not done. In the adrenals there were foci of necrotic cortical cells with early infiltration by polymorphonuclear leukocytes. There was marked hyperactivity of the bone marrow.

The microscopic diagnoses were: marked hyperplasia of the thyroid gland, acute bronchitis, acute hemorrhagic gastritis, focal necrosis of the corticoadrenal cells.

Unfortunately permission to examine the head was refused, so that the pituitary gland could not be examined.

DISCUSSION

Hyperthyroidism and Diabetes Mellitus It has long been known that disturbances in carbohydrate metabolism occur in hyperthyroidism.^{1,2,3} Opinions differ widely as to the character, frequency and conditions of these anomalies.^{4,5,6,7} Some authors find glycosuria present in only a small percentage of patients with exophthalmic goiter, while others have found it in over 90 per cent of their cases. Consequently Joslin, Root, White and Marble⁸ have suggested an arbitrary standard for diagnosis of diabetes in hyperthyroidism, namely a blood sugar of 0.15 mg per cent fasting, or of 0.2 mg per cent or more after meals, in addition to glycosuria.

In more than half the uncomplicated cases of exophthalmic goiter studied by Andersen⁹ the fasting blood-sugar level was a little higher than is considered normal. The alimentary blood-sugar curve was increased in height and duration. The latter was most marked in the more severe cases, yet there were several exceptions.

The mechanism of the sugar-excretion threshold, according to Cushny¹⁰ and later Ni and Rehberg¹¹ depends upon the filtration of glucose through the glomeruli and its reabsorption in the tubules. This reabsorption is dependent upon the blood-sugar concentration, and when this reaches a certain level, known as the excretion threshold, the glucose contained in the glomerular filtrate can no longer be absorbed completely in the tubules and glycosuria results. Which factors determine this reabsorption of glucose has not yet been settled, but it is the

predominant view that the influence is of a hormonal nature, a hormone from the pituitary perhaps being responsible.

Joslin and Lahey¹² have indicated the seriousness of this clinical combination. The average duration of life for their group of cases was 3.4 years.

Hyperthyroidism and Hypoglycemia Blood-sugar studies on postoperative thyrotoxic patients observed by Holman¹³ showed a rather sudden onset of hypoglycemia twenty-four to thirty-six hours after operation in 2 patients, who responded dramatically to glucose therapy. Here manipulation of the gland during operation resulted in flooding the general circulation with a large amount of thyroid secretion. Consequently a tremendous increase in metabolic processes occurred, causing a utilization of available carbohydrates, especially the glycogen reserve of the liver and muscle tissues. Now, if there is sufficient active thyroid secretion in the circulation—which may be the case either in the spontaneous or the postoperative thyroid storm—there will come a time when all available carbohydrate supply of the body is depleted and hypoglycemia is precipitated. That this condition occurred as a terminal feature in the case presented is shown by the sugar determination of 30 mg per cent after a fairly persistent hyperglycemia and glycosuria. The remarkable loss of body weight while on the ward appears to have paralleled the tremendous amount of sugar excreted in the urine.

Pulmonary edema was noted clinically as a terminal feature, a finding which Maddock, Pedersen and Coller¹⁴ have commented upon as a frequent terminal event associated with increased amounts of adrenine in the blood stream in cases of thyroid crisis, while neglecting the role of hypoglycemia. These authors report 3 typical cases of severe postoperative thyroid crisis in which pulmonary edema developed, 1 patient who recovered showed a negative chemical test for adrenine, whereas it had previously been positive. These authors believe that this respiratory complication has been overlooked in many cases in the past, the excessive mucus and the cyanosis being attributed to bronchopneumonia and tracheitis.

If blood-sugar studies are done more frequently, more cases of thyroid storm may show, as did ours a sudden onset of hypoglycemia, which probably stimulates the adrenal medulla to secrete large amounts of adrenine into the blood stream and results in the terminal pulmonary edema. Another possibility is acute left ventricular failure, due to the hypertension and causing pulmonary edema.

Acute Abdominal Symptomatology in Hyperthyroidism Kraus¹⁵ and Desbours¹⁶ describe cases of acute abdominal pain occurring during the

course of thyrotoxicosis. There are very few references to this factor in the American literature. Robertson, Wohl and Robertson¹⁷ describe 3 cases of moderate hyperthyroidism with abdominal symptoms simulating a surgical abdomen. Acute attacks of vomiting and abdominal pain may be due solely to overactivity of the thyroid gland. With the administration of compound solution of iodine the symptoms of thyrotoxicosis and abdominal pain are entirely relieved, but when iodine is omitted the thyrotoxic symptoms reappear.

Differentiation is at times impossible, especially if we bear in mind the rather high incidence of duodenal and gastric ulcers in patients with thyrotoxicosis.¹⁸ The acute abdominal symptoms of diabetes mellitus must also be considered in the differential diagnosis. It is possible that in our case there was a summation of the effect of the diabetic and thyrogenic factors upon the gastrointestinal tract, resulting in paralytic or adynamic ileus, a finding not encountered in the literature of hyperthyroidism or of diabetes mellitus. It was this almost persistent gastrointestinal catastrophe which made it impossible to maintain an adequate caloric intake.

Thyroid Storm or the Comatose Form of Graves's Disease. The hyperthyroid aspect of this case conforms in many respects to Zondek's¹⁹ classical description of the comatose type of Graves's disease. Some mild infection such as tonsillitis or bronchitis may cause the tremor and restlessness characteristic of Graves's disease to give place suddenly to intense asthenia, or there may be no such preliminary. Toxic phenomena such as wasting, sweating or tachycardia may suddenly occur, even though the metabolic rate is not much increased, also, exophthalmos and goiter may be slight or absent.

After a variable period of excitement consciousness grows dimmer, a peculiar rigidity develops in which facial expression is lost, and the countenance assumes a blank look. Later the patient may lose consciousness almost completely. Except for lack of rigidity of the limbs, the condition resembles catalepsy. The mouth and other mucous membranes are extremely dry. A serious symptom is difficulty in swallowing, which may lead one to suspect bulbar paralysis.

At the Massachusetts General Hospital, Means²⁰ has reported that from 1924 to 1935 there have been 14 patients with postoperative storm, 10 (71 per cent) of whom died. Consequently thyroid storm still constitutes an important cause of death.

The Chronic Form of the Acute Syndrome. Cases of Addison's disease following thyrotoxicosis have been reported by Etienne, Etienne and Richards,²⁴ Chauffaud and Giro,²⁵ and Brenner²⁵

That the adrenal cortex inhibits thyroid activity has been shown by Marine and Baumann.²⁶ They found that incomplete destruction of the adrenal cortex in rabbits with intact thyroids—but not in those with thyroids removed—caused a rise in body temperature, and they suggested that adrenal insufficiency might be the cause.

Recent evidence²⁷⁻²⁸ suggests that the adrenalectomized animal develops hypoglycemia because it cannot form liver glycogen from endogenous sources, this may be the cause of the hypoglycemia so often noticed in this disease, and may explain the occurrence of the convulsions and coma—in the absence of hemoconcentration or changes in blood chemistry—that are characteristic of Addisonian crisis.

Anderson and Lyall²³ described a case of thyrotoxicosis in a thirty-year-old single woman who developed Addison's disease seven years after x-ray therapy. Coma and muscular spasm which occurred as terminal symptoms seemed directly related to extreme hypoglycemia rather than to Addisonian crisis, since plasma electrolytes and the blood volume were within normal limits.

SUMMARY

A case of spontaneous thyroid storm, diabetic acidosis and paralytic ileus which terminated in hypoglycemic convulsions and pulmonary edema is reported, with autopsy findings.

An explanation offered for the mechanism of this death is that spontaneous liberation of an enormous amount of active thyroid secretion into the general circulation precipitated the hypoglycemic convulsions, which were followed by the rapid development of pulmonary edema and death.

It is suggested that a summation of the extreme effect of both the thyrogenic and the diabetic factors upon the gastrointestinal tract resulted in paralytic ileus.

The importance has been indicated of following the condition with frequent blood-sugar determinations to discover the critical period when exhaustion of the body's glycogen supply occurs, and the value of glucose therapy has been noted.

I am indebted to Dr. Joseph E. Hallissey for permission to publish this case.

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THE INCIDENCE OF TUBERCULOUS INFECTION IN SURGICALLY REMOVED TONSILS

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MIDDLEBORO MASSACHUSETTS

MANY workers have reported from time to time on the frequency of tuberculous infection in extirpated tonsils. Most of this work has been done in the clinics of general hospitals. Weller¹ in 1921 reported a study of surgical material received routinely in the laboratory from 1906 to 1919, the incidence of histopathology of tuberculosis in 8607 specimens was found to be 2.35 per cent. Mullin² analyzed 400 cases and found an incidence of 4.3 per cent, but in 60 per cent of these cases there was evidence of tuberculosis elsewhere. Wilkinson³ reported that whereas the incidence of tuberculous infection in 600 tonsils removed in 1900 was 1.3 per cent, this figure dropped to 0.5 per cent for 10,000 tonsils removed from 1923 to 1927. Magee⁴ carried on this kind of study to determine whether the decreased incidence of most forms of tuberculosis would be reflected in the tonsillar tissue examined. She showed the incidence in 6280 tonsillectomies performed from 1933 to 1935 to be 0.4 per cent. This is a definite decrease as compared to 2.35 per cent reported¹ from the same clinic in 1920. I have seen no reports in the literature on the frequency of tuberculous infection encountered in tonsils removed in institutions for tuberculous patients.

In this communication I report the results of 202 tonsillectomies performed on patients, mostly children, at the Lakeville and North Reading state sanatoriums between 1933 and 1937. Of these patients, 172 were operated on at Lakeville, where all forms of extrapulmonary tuberculosis are

treated, and 30 at North Reading, where the childhood type of pulmonary tuberculosis is treated. The indications for removal of the tonsils were chiefly their injected and cryptic appearance, a history of frequent sore throat, and the presence of suppurative cervical lymph nodes. We have found that the cervical-lymph-node cases almost invariably benefit from tonsillectomy, and urge this procedure in such cases as a matter of routine.

Of the 202 specimens examined histopathologically, 21, or 10 per cent, showed tuberculous infection. Six of these were removed from the 30 patients at North Reading, and 15 from the 172 patients at Lakeville. The infection found in the removed tonsils may be considered as latent, for in no case was there a preoperative diagnosis of tuberculosis of the tonsils. The tuberculous lesions for which the patients were admitted to the sanatoriums are listed in Table 1, together with the appearance of the tonsils on admission and other data of interest. The throats did not differ in appearance to any great extent from those of patients in whom tuberculous infection was not found. In fact, they resembled those seen in any group of people of a corresponding age with tonsils remaining. Of interest, however, is the fact that 10 of the 21 patients had palpable cervical lymph nodes.

Many workers⁵ support the view that the tonsil or the pharyngeal mucous membrane is the portal of entry for the tubercle bacilli. With the mucous membrane intact, the healthy tissue can resist the bacilli, but when its continuity is broken, either

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by a tear or by disease, the organisms may easily enter the deeper structures. From there they may travel to the cervical lymph nodes or to any other part of the body, or they may lie dormant, thus becoming a possible source of further auto-infection.

It is not my purpose to prove that these tonsils were or were not the primary foci of the tuberculous lesion that brought the patient to the sana-

tonsils removed, whether in a sanatorium, a general hospital or at home, also appears desirable.

SUMMARY AND CONCLUSIONS

Of 202 tonsils removed from patients at the Lakeville and North Reading state sanatoriums, 21, or 10.4 per cent, showed tuberculous infection.

These tuberculous tonsils, in general, by appearance and behavior could not be distinguished from

Table 1 *Data on 21 Cases in Which Tuberculous Infection Was Found to Be Present in Surgically Removed Tonsils.*

CASE	AGE	TUBERCULOUS LESION FOR WHICH ADMITTED	PREVIOUS SORE THROAT	CONDITION OF CERVICAL LYMPH NODES ON ADMISSION	CONDITION OF TONSILS ON ADMISSION
1	37				
2	2	Peritonitis	Infrequent	None palpable	Not remarkable
3	6	Spine	None	1 on left side	Not remarkable
4	3	Knee, right	None	None palpable	Slightly enlarged
5	7	Ankle, left hilum	Frequent	Some on each side	Large injected
6	7	Cervical adenitis	None	Numerous and enlarged	Enlarged injected
7	2	Spine	None	None palpable	Enlarged not injected
8	3	Spine	None	None palpable	Hypertrophied not injected
9	3	Spine	None	Several palpable	Enlarged injected
10	12	Hip	None	Several palpable	Enlarged not injected
11	12	Cervical adenitis	Occasional	Several palpable	Enlarged injected
12	4	Cervical adenitis	None	Mass of glands (left)	Removed before admission adenoid tissue positive
13	27	Skin	Occasional	Few palpable	Small anterior pillar injected
14	20	Nephritis	None	Few and small	Not remarkable
15	3	Knee, left	None	None palpable	Small slightly injected
16	9	Spine, hilum	Occasional	None palpable	Hypertrophied and cryptic
17	5	Childhood	None	Anterior cervical palpable	Enlarged cryptic
18	3	Childhood	None	Few palpable	Medium sized
19	12	Childhood	Occasional	None palpable	Enlarged cryptic
20	10	Childhood	None	None palpable	Medium cryptic
21	7	Childhood	None	None palpable	Enlarged cryptic
22	11	Childhood	None	History of drainage	Medium enlarged cryptic

torium. My desire is to emphasize the high percentage of tuberculous infection found in the tonsils of these patients, who were suffering from one form or another of the disease.

If we assume that the tonsils are the first structures to harbor tubercle bacilli, then their early removal, in such cases, may prevent the further spread of the infection to more vulnerable parts of the body. On the other hand, if we discount the above view, we must bear in mind that tuberculous infection in the tonsils is always a potential source of subsequent auto-infection with the development of other and more serious lesions. The necessity for the removal of all abnormal or suspicious tonsils in cases with tuberculosis thus becomes apparent. The routine examination of all

chronically infected tonsils ordinarily encountered.

The removal of all diseased tonsils in children and adults suffering from tuberculosis is recommended.

All tonsils thus removed should be subjected to a careful histopathological examination.

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CASE RECORDS OF THE
MASSACHUSETTS GENERAL HOSPITALANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24241

PRESENTATION OF CASE

A forty-two-year-old, native-born, white housewife entered the hospital with the complaint of fatigue and weakness of eight months' duration.

She was entirely symptom free until eight months before entry when, over a period of two months, she had four attacks of nausea, vomiting and "gas" accompanied by epigastric and right upper quadrant pain radiating to the midscapular region. The attacks lasted several hours and were severe enough to require hypodermic injections for relief. She was advised to have an operation but refused, and because of apprehension ate very little for the next month, with consequent loss of weight. Her physician, however, finally made her take a well-rounded, low-fat diet, but in spite of this she continued to lose weight, losing a total of 23 lb before she entered this hospital. She had no attacks of pain and nausea during the six months before entry, but she had frequent attacks of epigastric fullness and gas on the stomach. She also worried a great deal and was very easily fatigued. She had no jaundice, hematemesis, melena, diarrhea, clay-colored stools, change in bowel habits or change in the color of her urine.

Nine years before entry she had a left salpingo-oophorectomy for acute lower abdominal cramps and fever. Twenty months before entry a mole was removed from her left forearm. At the time of the operation the surgeon noticed flecks of pigment deep in the subcutaneous tissue beneath the lesion and did as wide an excision as possible. He advised an axillary dissection which was refused. The pathological report was melanotic sarcoma. Her past history was otherwise essentially negative, and her family history was noncontributory.

Physical examination revealed a thin, undernourished woman in no acute distress but quite apprehensive. There was tenderness to deep palpation in the right upper quadrant, and liver dullness extended two fingerbreadths below the costal margin although the edge could not be palpated. The heart and lungs were negative, and the blood pressure was 106 systolic, 70 diastolic.

The temperature was 98.6°F., the pulse 90. The respirations were 20.

The urine had a specific gravity of 1.008 and

contained a slight trace of albumin. The blood showed a red-cell count of 3,880,000 with 70 per cent hemoglobin and a white-cell count of 20,500 with 74 per cent polymorphonuclears.

On the third day a laparotomy was performed.

DIFFERENTIAL DIAGNOSIS

DR HORATIO ROGERS. The attack eight months before entry which opens this history is suggestive of acute cholecystitis. As the story goes on, however, the patient has no more pain. Her loss of weight is not accounted for by her dietary habits because it is stated that in spite of a well-balanced diet she continued to lose weight. Her general complaint is fatigue, weakness and loss of weight, and to that we can add anemia and hypotension. Those things we are sure of.

The common causes of such symptoms and findings will have to be considered, but before doing so we might scrutinize this episode twenty months before entry, when she had an excision of what was thought to be a pigmented mole but which turned out to be a melanotic sarcoma. The surgeon was unable to do as extensive an operation as he would have liked to do so that we are justified in supposing that she may not have been cured. Is there anything in this picture that is incompatible with that supposition? Metastases would account for her enlarged liver, which in turn might cause her high white count. Progressing sarcoma would account for fatigue, weakness, anemia and loss of weight. Her hypotension could be accounted for on the basis of metastases in the suprarenals, although it is hardly necessary to account for it specifically in a woman who is apparently so sick. We know that melanotic sarcoma is highly malignant that it metastasizes very widely, and that it has two general methods of metastasizing, visceral and cutaneous. She obviously has no cutaneous metastases, but that does not mean she could not have visceral metastases and, if she has, they will undoubtedly be in the liver because of being blood borne rather than lymph borne. No melanin is reported in the urine, which is surprising if her viscera are full of melanotic sarcoma. If I am right it means that melanin was not looked for.

I believe that this is the best explanation of the whole picture, but in order not to leave anything out, I think we should consider some of the other causes of weakness and fatigue, loss of weight and so on.

Could she have chronic blood loss from a bleeding ulcer, perhaps accounting for her upper abdominal episode? No blood was found in the stools or at least there is no record of it, also I am told that with chronic blood loss her hemoglobin would be lower in proportion to her red count. She has not much anemia.

Could it be chronic sepsis from the gall bladder? She was too sick for that. Her disease has progressed far when her general health is taken into consideration, yet there are no further symptoms referable to the gall bladder.

There is no indication of liver abscess. She has had no chills and her temperature is not high. Tuberculosis and syphilis I cannot rule out, but there is nothing in particular to make us think of them here.

As regards disease of the adrenals, Addison's disease, there is no pigmentation of the skin, and we can account for her hypotension on other grounds.

If it were cancer other than melanotic sarcoma it would have to be cancer of the stomach or liver or gall bladder, either metastatic or primary. There is no reason why it could not be, but we already have an etiology for metastatic malignant disease staring us in the face which I am afraid not to use.

My diagnosis, therefore, is extensive visceral metastases from a non-cured melanotic sarcoma.

PREOPERATIVE DIAGNOSES

Chronic cholecystitis with cholelithiasis
New growth?

DR ROGERS'S DIAGNOSIS

Visceral metastases from melanotic sarcoma

ANATOMICAL DIAGNOSES

Metastasizing melanotic sarcoma, involving gall bladder, skin, intestines, spleen and both adrenals

Melanosis of kidneys
Bronchopneumonia

PATHOLOGICAL DISCUSSION

DR TRACY B MALLORY When this patient came into the hospital the full details in regard to that mole were not known. The symptoms in the right upper quadrant were suggestive enough so that it was felt worth while to explore with the question of cholecystitis in mind. That was done and a most extraordinary gall bladder found. It was covered with black spots on its surface and contained internal, large, dangling polypoid masses, which were also black, and which one might easily imagine might have extended down into the neck of the gall bladder and produced obstruction, just as a stone might. The gall bladder was removed but any further treatment seemed pointless and she was discharged to another hospital where she remained for one or two months until death. During the terminal period she developed intractable diarrhea and eventually, many black spots in the

skin. The autopsy was performed there. This is the gall bladder and even those of you who are sitting in the back of the room can see the multiple black nodules. One of the most striking features of the autopsy was the kidneys. They were almost jet-black in color and on section virtually every glomerulus contained masses of melanin. The melanin in the glomeruli seems mostly to be contained in foci of metastatic tumor, but there is also a great deal of the melanin which has been absorbed by the tubular cells. I think there is no question but that she had marked melanuria during the later stages of life that could have been found easily if it had been looked for. So far as I know, it was not. There was complete destruction of one adrenal by the tumor and metastases in the other adrenal which may or may not have had something to do with the symptoms. The entire gut was lined with hundreds of tumor nodules looking like polyposis but all consisting of melanoma. There were metastases in the spleen, which is not uncommon in sarcoma, whereas it very seldom occurs in carcinoma. The most surprising feature of the autopsy was that even with the most careful search not the minutest nodule of tumor could be found in the liver.

CASE 24242

PRESENTATION OF CASE

A fifty-two-year-old, white, American physician entered the hospital with the complaint of abdominal pain, diarrhea, fever and malaise of four months' duration.

For eight or ten years he had four or five semi-solid bowel movements daily, without pus or mucus in the stools, and studies had shown a "spastic colon." Eight months before entry he had an attack of acute pain centered around the umbilicus which was relieved by gr $\frac{1}{4}$ of morphine. The attack cleared up in a day. Four months before entry he had an attack of apparent enteritis, characterized by chills, fever, diarrhea, distention of the abdomen and generalized abdominal pain. There was an epidemic of enteritis at that time in the community where he lived. The acute attack lasted for about a week, but he never fully recovered. Three months before entry his symptoms became worse, and he had acute umbilical pain and "catching" pain in the right costal margin which required gr $\frac{1}{2}$ of morphine for relief. Two days later a laparotomy was performed for removal of a ruptured appendix. The abdomen was full of serum, and the appendix was thought to be ruptured at its base. The ileum was said to be normal. He had a rather stormy con-

valescence and drained material from the wound for a month. One of two cultures of this was positive for streptococci. On the fifth postoperative day he passed five, large, soft stools which did not contain blood. He resumed ambulatory activity one month after the operation but developed mild fever and malaise which subsided on bed rest. Subsequent attempts at activity caused a return of the symptoms. Five weeks before entry to this hospital he entered another outside hospital where his white-cell count was 19,000 and a gastrointestinal x-ray series showed no intestinal obstruction. The last 20 cm of the terminal ileum was not visualized although the barium had passed through it with ease. During the entire period after the operation the lower part of his abdomen had been distended and slightly tender, and he had attacks of gas-pain, and peristaltic rumblings and gurglings which sometimes lasted as long as an hour. He obtained no relief from his symptoms in spite of continued bed-rest and low residue diet. On several occasions his sedimentation rate and white count were elevated. About four weeks before entry he noticed in the region of the appendix scar the presence of a mass which gradually increased in size. During the few days before entry it enlarged rapidly and became somewhat tender. He had no nausea, vomiting, hematemesis or melena, but had lost about 20 lb in weight during his illness. He had not been exposed to tuberculosis except during his professional work, but he regularly drank raw milk. He had always lived in New England and had enjoyed the best of health. He had had catarrhal jaundice at the age of twenty and for some years had had some difficulty in starting his urinary stream. His past history was otherwise negative and his family history noncontributory.

Physical examination revealed a well-developed but quite thin man who did not appear to be acutely ill. The heart and lungs were negative. The blood pressure was 95 systolic, 60 diastolic. The abdomen was slightly distended, and in the right lower quadrant, medial to a well-healed scar, there were spasm and tenderness over an easily movable mass measuring 2 by 5 cm. There was no rebound tenderness, and peristalsis was normal.

The temperature was 100.5°F., the pulse 95. The respirations were 20.

The urine examination was negative. The blood showed a red-cell count of 4,500,000 with 85 per cent hemoglobin, and a white-cell count of 9700 with 78 per cent polymorphonuclears. The stool gave a 1+ guaiac test. A barium enema passed to the cecum slowly and with much difficulty, because of nervousness of the patient. The tip of the cecum was entirely obliterated by a large mass, and the terminal ileum failed to fill. A gastro-

intestinal x-ray series showed a normal small intestine. The terminal ileum passed around the mass at the tip of the cecum and was probably adherent to it. There was, however, no definite evidence of intrinsic disease in the small bowel.

A laparotomy was performed on the eighth day.

DIFFERENTIAL DIAGNOSIS

DR. WALTER E. GARREY. This is the story of a fifty-two-year-old man who for eight or ten years had four or five semi-solid bowel movements daily. Presumably this was the normal bowel habit of a somewhat irritable colon. He had a barium enema at some time during this period. We do not know how long before so we get no help in determining when the colon last appeared entirely normal. The real difficulty began four months before entry, when he had an episode of chills, fever, diarrhea and abdominal distention. This quieted down for about a week, and again, a month after that, he had another acute episode followed by a laparotomy, during which I shall assume a ruptured appendix was found and removed. We do not know anything about the pathology of the appendix, whether there was primary appendicitis or whether it was secondarily involved in some infectious process such as might result from ulceration and perforation at the base of the cecum with peri-appendicitis. Presumably microscopic slides, if they were made at the other hospital, were not available here.

At no time did the patient have any blood in his stools, and while he had five, large, soft stools in one postoperative day after the appendectomy, apparently he had no further bowel trouble. Then he began to have evidence of low-grade sepsis and abdominal gurgling and pain, with slight distention, symptoms which are pretty good clinical evidence of some degree of interference with peristalsis, or a slight degree of subacute obstruction.

One point about the x-rays interests me very much, and that is whether the x-ray people thought this mass was intrinsic or extrinsic to the bowel. May we see the films, Dr. Holmes?

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES. In all the films there is definite abnormality in this region near the tip of the cecum where you see an area unfilled by the barium. Moreover, the terminal ileum is displaced upward to form a rather sharp curve in all films, no matter what position the patient is in. The tip of the cecum is never filled, but in films taken with special reference to the tip you can see the outline of it. The edges are somewhat lobulated, particularly in this one area. The question that we raised was whether the lesion was

wholly in the cecum or partly in the cecum and partly outside. In other words, did he have an abscess outside the cecum which was pressing on it and which was displacing the terminal ileum or did he have a mass in the cecum itself which extended out and perhaps involved the ileum. As far as we could make out the disease did not extend into the ileum itself. The ileum is not blocked and the mucosal pattern in the ileum appears normal, so that a condition such as ileitis or tuberculosis would be unlikely. An inflammatory mass outside the cecum might explain this part of the defect but not the whole picture. He might have a lesion in the cecum and a mass outside. We felt confident that it was not entirely due to a mass outside, and that there must be an intrinsic lesion.

DIFFERENTIAL DIAGNOSIS (continued)

DR GARREY. It certainly is fair to say that regardless of the acute episode of appendicitis with perforation, he had underlying pathology which was intrinsic in the cecum. He has evidence of three months' difficulty after appendectomy. This is compatible with a lesion producing some slight degree of obstruction in this area. The question of whether the underlying pathology in the cecum was present at the time of the appendectomy and whether necrosis in the cecum with perforation was the primary episode and the appendix secondarily involved, I do not believe I can definitely answer. But it seems as if that might have been a very likely possibility. The absence of any change in bowel habits and the frequent soft stools are sufficiently characteristic of a mass in the region of the cecum with a slight degree of intermittent obstruction.

The physical examination is of considerable interest in that it tells us that this mass was movable at the time of the patient's entry here. If that is a correct observation I think it is of importance because I do not see how an inflammatory residual mass which followed a ruptured appendix could be a movable one. The presence of a movable mass in acute appendicitis with perforation has occasionally been noted, but I do not know of any instance where it was both movable and a residual abscess. The blood count is of considerable interest in that he did not have any great degree of anemia. In summary, I believe he has intrinsic disease of the cecum, that it has been present throughout the whole illness and that it now is secondarily infected, either as a result of the appendicitis or of a perforation, and that the mass is most likely to be caused by either tuberculosis or carcinoma. Other lesions that might possibly be considered are either amebic or nonspecific

granuloma of the cecum, the latter being the type which involves the small bowel and ileum, regional ileitis, or some rare tumor, but I do not see any definite evidence pointing to any of these lesions and I believe our differential diagnosis lies between tuberculosis and a scirrhous carcinoma of the cecum with, in each case, some secondary infection in or around the area. The fact that the mass is movable is in favor of tuberculosis. It seems to me that carcinoma of this long standing with resulting perforation probably would have become fixed in that time. Certainly the great majority of carcinomas of the right colon do bleed, or give some history of bleeding as evidenced in the stools or by the presence of anemia, which this man does not have. Dr Holmes mentioned the fact that the terminal ileum was not involved and we also might say that this is against tuberculosis, the most common tuberculous lesion being an ulcerative one involving both the terminal ileum and the cecum. However, hyperplastic tuberculosis of the cecum does occur without involvement of the terminal ileum. The man certainly should have a laparotomy. It is entirely possible that the surgeon, even after opening the abdomen and inspecting the tumor, may have had difficulty in deciding between tuberculosis and cancer. My first diagnosis is tuberculosis of the cecum, with carcinoma of the cecum as a second possibility.

CLINICAL DISCUSSION

DR CHESTER M. JONES. I saw this patient when he was in the hospital, and I think he illustrates a point that is important diagnostically. His history, I believe, should have given the clue to the diagnosis right from the start, had one localized his pain accurately. I went through the same line of reasoning as Dr Garrey did. It was difficult to get a proper history, because he was a surgeon and was convinced he had appendicitis. In talking about his "appendiceal abscess" the one thing he spoke of all the time was that he had umbilical pain, and pain nowhere else. He always limited it to an area about the size of a quarter, no larger. It was a striking localization and, on the basis of that, one had to decide what kind of terminal ileal or ileocecal disease he had. That pain is not the pain of appendicitis, to my mind. The five-year story of diarrhea preceding pain interested me and on the basis of that I thought we had to consider terminal ileitis or tuberculosis. I thought that he should be explored, and that the appendicitis at best was only a coincidence in a much more generalized process. I wrote down in the record that I thought he had disease of the terminal ileum with possibly some involvement of the cecum.

DR MARSHALL K. BARTLETT. When the abdo-

men was opened we found a mass in the region of the cecum. It was not adherent to the under side of the old appendix scar, but was adherent in the right gutter, and there were glands medial to the cecum which seemed to be broken down and perhaps caseous and yet the tumor itself suggested neoplasm. We were not sure of the diagnosis until we took a biopsy from one of the glands. Dr Mallory did a frozen section on this and told us it was carcinoma. On exploration of the liver we found it was full of metastatic disease. I have never seen one more so. In view of the inflammatory condition that he had had it is interesting to know that between the first and second stages of the operation the mass became adherent to the old scar and formed an abscess which drained spontaneously. There must have been a good deal of inflammatory reaction around the tumor at the time of operation.

PREOPERATIVE DIAGNOSIS

Abscess in the region of the terminal ileum and cecum

DR GARREY'S DIAGNOSES

Tuberculosis of the cecum
Carcinoma of the cecum?

ANATOMICAL DIAGNOSIS

Adenocarcinoma, grade III, of cecum, with metastasis to regional lymph nodes

PATHOLOGICAL DISCUSSION

DR TRACY B MALLORY The main tumor mass was in the cecum but it had involved the margin of the ileocecal valve, so that was unquestionably the point of obstruction and as Dr Jones pointed out, explains the umbilical localization of the pain.

DR HOLMES May I call attention to the fact that the outline of this mass is lobulated on the inner surface. I think that is against tuberculosis. One should give that some weight in diagnosis. Sometimes the radiologist has an advantage over the surgeon even when he has the tumor in his hand. The radiologist is looking at the inside and the surgeon at the outside.

DR. GARREY Was the mass movable?

DR. BARTLETT It was. It is interesting that he had an acute perforated appendix. I have seen one other patient who had carcinoma of the cecum and had acute appendicitis some months before. That is a fairly rare combination. There are only a half dozen cases recorded.

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THE ANNUAL MEETING

IN response to the call for the annual meeting of the Massachusetts Medical Society, more than one fourth of the members registered attendance. The record shows that 1387 applied for badges. Others were also present who did not register. This large proportion of the fellows was due to the attractive programs arranged by the officers of the Society and the several committees. There were included, besides the scientific subjects selected for addresses, exhibits of educational value, arrangements for bringing together the alumni of medical schools and plans for the entertainment of non-medical groups.

Sixty doctors competed for the golf prizes and 204 ladies registered as guests of the Society.

The scientific and commercial exhibits were well arranged with qualified persons in charge. The

interest shown in these displays must have pleased those who devoted so much time to preparing and arranging them.

The Section meetings were well attended. The experiment of last year of having one full day given to bringing together general practitioners and recognized authorities in the special fields of practice for the discussion of medical problems, was repeated. The large attendance apparently indicates the advisability of the continuance of this plan.

On Tuesday evening, preceding the Shattuck Lecture, Dr. Thomas Parran, Surgeon General of the United States Public Health Service, spoke of the work and aims of this department. After giving an account of the great accomplishments in the fields covered, he warned the profession that further advances in public health work will depend, to a large extent, on the loyal co-operation of physicians and all other agencies interested in promoting the health of the people of this country. Following Dr. Parran's address, Dr. David Riesman, emeritus professor of clinical medicine and professor of the history of medicine at the University of Pennsylvania School of Medicine, delivered the Shattuck Lecture, in which he gave a history of the discovery of many new diseases by the physicians of this country. This was a scholarly address made especially interesting by the speaker's ability to present the facts in an attractive setting of well-chosen phrases. All persons interested in medical history will enjoy reading the paper which will appear soon in the *Journal*.

On the evening of the second day 325 fellows and guests met for the annual banquet. The after-dinner speaker was Mr. Norman MacDonald, executive secretary of the Massachusetts Federation of Taxpayers' Associations. In selecting the speaker for this occasion the President evidently felt that the scientific programs of the meeting were so broad and inclusive that it would be well to divert attention from medical subjects to a topic of a non-medical nature, and which would be of common interest to all people of this state. The speaker presented an array of facts pertaining to taxation and the burdens imposed on the average citizen.

thereby, emphasizing the danger which he believes is impending under financial and economic theories already on trial. He evidently wished to create in the minds of the intelligent portion of the population a purpose to pay more attention to the economic uncertainties that are associated with the depressions and recessions now prevailing.

The audience was very much impressed by the facts and arguments submitted.

THE COUNCIL MEETING

While the scientific programs were being carried on, the stated meeting of the Council was in session on the second day. This meeting was called to order by the President at 10.30 a. m. with 232 present. The reading of the records of the February meeting was dispensed with because of previous publication in the *Journal*.

The President presented brief biographical sketches of the lives of those councilors who had died since the last meeting and the Council rose and stood for a brief period in tribute to the memory of these departed fellows.

All the district societies were found to be represented by nominating or alternate nominating councilors and this group was directed to retire and consider names to be presented for the positions of president, vice-president, secretary, treasurer, and orator for the ensuing year. After a brief interval the report of this committee was submitted and the following designated persons were placed in nomination: For President, Channing Frothingham, for Vice-President, Albert Warren Stearns, for Secretary, Alexander Swanson Begg, for Treasurer, Charles Shorey Butler, for Orator, Elliott Proctor Joslin. No nominations coming from the floor, the Secretary was authorized and directed by vote to cast one ballot for the persons nominated. This was done and the nominees were elected.

References to the re-elected officers have been published in the *Journal* previously.

Both Dr. Stearns and Dr. Joslin have national reputations. Dr. Stearns was born in 1885 and graduated from the Tufts College Medical School

in 1910 and occupies the positions of Dean and professor of psychiatry in this school.

Dr. Joslin was born in 1869 and graduated from the Harvard Medical School in 1895. For many years he has devoted a large proportion of his time to the Diabetic Clinic at the Deaconess Hospital in addition to his position of clinical professor of medicine at the Harvard Medical School.

The usual routine business relating to membership and the appointment of committees was transacted without discussion. Dr. Lund, chairman of the Committee on State and National Legislation, gave a detailed account of the work of his committee. Although disappointing in one particular this report was in the main encouraging. The opponents of sound medical education succeeded in getting the legislature to postpone the operation of the law which originally gave to the authorities power to pass on the standing of medical schools from which graduates apply for registration to practice medicine in Massachusetts. The report when published in the Proceedings of the Council will give the essential facts relating to legislation of interest to physicians.

The proposed amendment to the by-laws providing for the method by which delegates to the House of Delegates of the American Medical Association are to be elected was the subject of an animated discussion.

A majority and a minority report of the committee in charge of preparing a draft of the procedure were before the Council. A minor change in the wording of the majority report brought unanimous support. This, with all the other amendments to the by-laws (copies of which had been sent to all members of the Society), was approved by the Council and forwarded to the Society for final action.

The problems relating to prepaid hospitalization which have been studied by the Committee on Public Relations came up for discussion in an attempt to secure proper recognition of the standing of all classes of doctors in this plan for hospital service. This subject was again referred to the Committee on Public Relations for further

consideration and conference with all parties in interest

Other subjects considered will be found in the report to be published. The work of the Council was prosecuted without undue delay and was completed soon after one o'clock when the meeting adjourned for the Cotting Luncheon.

After the completion of the Section meetings at noon of the third day the Annual Meeting of the Society was called to order by the President.

The Secretary reported the number of admissions to the Society for the year. These exceeded the number removed from the membership list by 122, bringing the number of members now enrolled to 5298.

Resolutions were submitted from the floor emphasizing and endorsing the action of the Council Meeting in February relating to the reappointment of Dr. Henry D. Chadwick to the position of Commissioner of Public Health. These resolutions were unanimously approved and have been forwarded to His Excellency Governor Hurley and the Governor's Council.

The several amendments to the by-laws which were forwarded by the Council were adopted by the Society. Copies of these amendments had been sent to all fellows of the Society.

The sentiments of regret at the retirement of Dr. David Cheever, chairman of the Committee on Ethics and Discipline, Dr. David Blakely, chairman of the Committee on Membership and Finance and Dr. Arthur Marsh of the Committee on State and National Legislation as expressed by the President were endorsed by the Society. These three fellows have served the Society for many years with fidelity and devotion to the duties of the several positions occupied.

In his annual address the President reported that the financial condition of the Society is sound, due to the conservative administrations of the Committee on Finance and the Treasurer. References to controversies existing in organized medical bodies, the survey of the inadequacies of medical care, hospital service and other important matters before the profession showed his full under-

standing of the need for careful attention devoid of prejudice and ill-feeling.

The last official act of the Society was to listen to the Orator, Dr. Allen G. Rice, of Springfield. He discussed the surgical practice of former years as compared with that of the present, paying tribute to the quality of those who worked more or less single-handed and had to depend on sound thinking, manual dexterity and experience rather than the equipment of modern clinics for their success. This paper¹ will be enjoyed by all who will read it.

So far as this brief and sketchy reference to the successful meeting is concerned it is intended simply to arouse such interest as will lead to a careful examination of the reports of the Proceedings and the reading of the papers presented before the Sections.

Although the President expressed appreciation of the work done by the several committees no one other than those engaged in planning and carrying on the details of the many activities can realize the time and energy expended. Their best thanks will be found in the good attendance, the general pleasure expressed with the arrangements and service and the disappointment of the fellows who were unable to attend.

REFERENCE

1. Rice, A. G. The passing of surgical yeomen. *New Eng J Med* 218:905-911, 1938.

DR. SIGMUND FREUD

Many physicians are watching Vienna with interest as news comes of what is happening in that medical center. Of special interest is the fate of Dr. Sigmund Freud.

Freud started his medical career in the field of medical investigation, not of psychotherapy. But from the beginning the leading trend of his future work was revealed to consider insight and knowledge as the way to help and cure.

His first interest was given to physiology. One of his publications, a monograph on the effects of the coca plant, the medicinal use of which was unknown at this time, gave the cue for the discovery of cocaine as a local anesthetic. Later he turned to the anatomy and pathology of the brain, and this line of research brought him for the

first time face to face with the problem of psychoneurosis

This was the period—the eighties of the last century—when medicine with the help of many great discoveries had definitely established itself on a scientific basis. Yet the study of psychoneuroses and psychoses, due to their inaccessibility by the new methods and instruments, was still in the stage of a crude empiricism. They represented a dark corner which few cared to investigate, since there were so many important and fascinating discoveries to be made by studying organic processes with the help of the test tube and the microscope.

Charcot represented the most important exception. He had studied intensely the symptomatology of hysteria and furthermore had demonstrated that the phenomena of hypnosis, which hitherto had been regarded as sheer humbug, were real and deserved serious attention. To Charcot, then, Freud went and became his disciple at the famous clinic of the Salpêtrière in Paris and later on studied under Bernheim and Liébault. But the turning point in his career did not come until he learned that hypnosis could be used not only to give commands, which by reasons unknown were obeyed by the hypnotized patient, but also for the exploration of an otherwise hidden part of the mind.

This new knowledge came to him through Breuer, an eminent physician in Vienna, who had, somewhat by accident, discovered that a hysterical patient of his was able during her hypnotic state to tell him the meaning and origin of her symptoms, by revealing these secrets she had step by step got rid of her symptoms. On the basis of this and some similar experience a "cathartic" method was evolved. The joint work of Breuer and Freud was published under the title *Studies in Hysteria*.

Neither the first incomplete theory nor the mysterious and undependable technic of hypnosis was satisfactory to Freud. He then went on the lonely way of original and independent research. It led him to the dropping of hypnosis and replacing it by the more difficult and complicated but

far more adequate technic of "free associations." The importance of the "unconscious" for psychopathology, the dynamism of repression and the influence of infantile sexuality were thus brought to light.

We can distinguish three periods in Freud's life-work. In the first he developed and formulated his fundamental theories, explored the unconscious and demonstrated the role which it plays not only in psychoneurosis and psychosis but also in phenomena of pathologic character that yet belong to the working of the normal mind, such as the dream, and the so-called "psychopathology of everyday life." The crowning piece of this period is the *Interpretation of Dreams* which was published five years after its completion, when every part of it had stood the test of experience.

In the next period Freud showed in different ways the fertility and also the revolutionizing influence of the new science, these were not limited to the field of psychopathology. In a series of detailed case histories he demonstrated the mechanism of the struggle between instinct and repression, and the way in which the various forms and stages of this struggle produce the different forms of hysteria, obsessional neurosis, schizophrenia and paranoia. On the other hand he turned his attention to the social side of the mind and studied esthetic, sociologic and ethnologic problems from a new angle, namely from the point of view how much the beliefs, mass phantasies and institutions which man has evolved and accumulated in the course of the many centuries of his cultural development have been stimulated and influenced by unconscious tendencies and conflicts. The two representative works of this period are the *Introductory Lectures* and *Totem and Tabu*.

The third period is characterized by a still more and more widening concept of psychoanalysis. Without neglecting its clinical aspects Freud lifted it to a new level, the interest was not any longer narrowed down to the unconscious, but comprehended also the structure of the "ego." What had been an approach to certain problems of

psychology from the side of psychopathology became the beginning of a new psychology. In *Beyond the Pleasure Principle* the attempt was made to link up the laws ruling the human mind, especially its instinctual processes, with the principles of biology. In a series of books Freud probed the value and the function of the most important cultural achievements. *Civilization and Its Discontent* is the most remarkable of these works which — although Freud himself would protest against such a designation — must be termed deeply philosophic.

As shown even in this short sketch, Freud's interests and knowledge are widespread, comprising an astounding number of subjects. Besides his great contribution to psychiatry, besides his practical therapeutic work to which he devoted nine hours daily he found time to study many other scientific disciplines which he used for his work, and to know and enjoy the masterpieces of literature of the past as well as of his own day. Not satisfied with all that, he studied with special interest the history and civilization of old Egypt and made collecting its antiquities his hobby.

Freud has always led a quiet and retired life, given up entirely to his scientific and scholarly pursuits, far away from the strife of politics. While his ideas were heatedly discussed all over the world, while his name became a byword of reproach, he avoided all controversy and resisted every effort to let himself be drawn into the limelight of publicity. He has been continually surrounded by the love of his family — he had six children, of whom the youngest, Anna, became associated with his work — and the devotion of his nearest disciples to whom he has shown an unflinching loyalty. Outside of this circle he has but few friends, but among them are men like Thomas Mann and Romain Rolland.

He had lived in Vienna since early youth, inhabiting for nearly half a century the same rooms. Now, on the eve of his eighty-third year, he has had to leave his old home in search of a new country. We believe that he will take with him his unexhausted vitality and his unbroken strength of mind.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

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CASE HISTORY No 76 BLEEDING AT SEVEN MONTHS, RUPTURE OF THE UTERUS

Mrs. G. S., a white multipara, para six, aged thirty-seven, was first seen when she visited the prenatal clinic on October 20, 1937. She had been referred by a Community Health nurse who reported a trace of albumin in the urine.

Her family and past histories were negative. Catamenia began at fourteen, were never regular, frequently occurring as often as fifteen but never going over twenty-eight days, and lasting four days with no unusual discomfort. Her last period was July 28, making the expected date of confinement May 4. In 1923 she was delivered of a full-term, 7 lb. child, which is living, and in 1926 she had a living child by cesarean section at term. Other cesareans were done in 1924, 1927, and 1935, all at six months because of toxemia.

The patient weighed 224½ lb. Her teeth were in fair condition, her thyroid showed no enlargement, and there was no general glandular enlargement. The heart was normal in rate and rhythm. The lungs were clear and breath sounds were normal. The blood pressure was 158 systolic and 124 diastolic. The abdomen was fat and showed four separate scars extending from the symphysis pubis to the umbilicus or above. There was diffuse weakness in the region of the lower end of these scars. The abdomen showed no masses or tenderness. Vaginal examination showed the uterus to be about the size of a three-months' pregnancy. It could not, however, be felt through the abdomen. A voided specimen secured at this time showed a trace of albumin but nothing abnormal otherwise.

The patient was seen in the prenatal clinic six times and after the first visit presented a similar picture on each occasion. She had no complaints. Her weight was increasing gradually, her blood pressure had come down to within normal limits without treatment and was recorded as averaging 110 systolic and 60 diastolic. She showed no toxic symptoms and was reported to be in good condition. The urine examination on each of these occasions showed a trace of albumin, but these were

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

in every instance voided specimens. No other abnormal findings are recorded.

On March 4, when about thirty-two weeks pregnant, the patient commenced to have some nausea and moderately severe pain in the lower abdomen. She described this latter as radiating toward both lower quadrants. Thinking that this was indigestion she took some baking soda, and after that vomited twice. During this time she also commenced to have a pain in the lower back. She arrived at the hospital at 9.30 complaining of abdominal pain which was mostly in the right-lower quadrant. Because of her obesity the uterus was difficult to outline with any precision and no other structures could be felt in the abdomen. There was definite tenderness which was apparently located in the left side of the uterus. Shortly after admission to the hospital she vomited again. A catheter specimen of urine showed a large trace of albumin. Her blood pressure was 108 systolic and 70 diastolic, her pulse was 80, her temperature 98°F, and respiration 16. A white count was 16,600 and her hemoglobin was 74 per cent Sahli. Examination of the blood showed a nonprotein nitrogen of 35 mg., a uric acid of 4.2 mg per cent, chlorides of 270 mg per cent and a carbon-dioxide combining power of 36 per cent. Rectal examination produced moderate discomfort but no acute pain. There was no present-ing part in the pelvis.

Shortly after admission to the hospital the patient began to pass a small amount of bright-red blood by vagina. The attending physician saw her shortly after 11 o'clock at which time her blood pressure and pulse rate were about as on admission, but the abdominal tenderness was definitely increasing and included both sides of the uterus. It was thought at this time that she had had a premature separation of the placenta because of the abdominal findings, the trace of albumin in the urine, her history of repeated toxemias and the small amount of bleeding which she had had. In view of her repeated cesarean sections, it was decided to do another at once. During the preparation of the operating room the patient collapsed. Her blood pressure fell to 70 systolic, and she became pulseless. It was then obvious that she was bleeding severely and that she had probably ruptured her uterus.

The patient was anesthetized with cyclopropane. The abdomen was prepared with ether and half-strength iodine, and a median incision was made. On coming down to the peritoneum there was the bluish appearance characteristic of blood in the abdominal cavity. On opening the abdomen a large quantity of fresh and old blood was found. The uterus had ruptured, the placenta was com-

pletely detached, and the membranes were bulging through the rupture. No attempt was made to deliver the sac in toto, but the fetus, placenta and membranes were removed as quickly as possible and the abdominal cavity sponged free of blood. It was then found that the uterus was well contracted but showed a rupture running from the fundus down to the lower uterine segment. There were so many lateral adhesions to the uterus from the preceding operations that it was thought unwise to attempt hysterectomy. The uterus was closed with a continuous suture of No 2 chromic catgut. This controlled the bleeding very well. A second layer of continuous No 2 chromic catgut was inserted on the serous surface. The patient was then sterilized by the Madelener method. The abdomen was closed in layers in the usual manner, and stay sutures of heavy silk were inserted.

During the operation attempts had been made to give the patient intravenous glucose solution, but these were unsuccessful because the veins were collapsed. At the close of the operation an arm vein was exposed and a cannula inserted. Ten per cent intravenous glucose was started and the patient's condition commenced to improve at once. Her husband and a brother had been typed for transfusion but were incompatible and a transfusion of 500 cc of citrated blood from a professional donor was given shortly after the intravenous saline. This improved the patient's condition still further, and she was returned to bed in moderately good condition. There she was placed in medium Fowler's position and oxygen was started through an intranasal tube because of the reduced oxygen-carrying power of her blood.

Her highest temperature was 101.2°F, March 5, with a pulse rate of 120 and respirations of 48. The patient showed some cyanosis when the oxygen was discontinued. An x-ray plate of her chest, taken in bed, showed involvement of the upper lobe of the right lung. This was diagnosed as early pneumonia. She was more comfortable with the nasal oxygen than without it. The abdomen showed no distention and no tenderness except in the midline at the site of the incision. She was given 1000 cc more of 10 per cent glucose solution intravenously and a second transfusion of 500 cc of citrated blood. Her hemoglobin before the second transfusion was 67 per cent and the red count was 2,850,000.

On March 6, her highest temperature was 101.4°F, her pulse rate 108, with a drop in respiration to 32. Her blood pressure at that time had come up to 118 systolic and 68 diastolic. The patient was taking fluids by mouth and there was no nausea or vomiting. Her breathing was

much easier and her color was better than on the previous day. The abdomen showed no tenderness or spasm and very little distention. An effort had been made to secure sputum for pneumococcus typing, but the only specimen obtained was small and blood-streaked and might well have come from around the tube in the nasopharynx. A blood count showed 10,000 white cells, and 3,410,000 red cells.

On March 7, the pulse, temperature and respirations were about as before. Her general condition continued good and she commenced to pass gas by rectum. She was taking a soft-solid diet. This continued until March 10 at which time a second x-ray of her chest showed considerable improvement in her lung condition. On March 13 her temperature had dropped to 99.6°F, her pulse rate to 96 and her respirations to 20. Her bowels were moving and she was on a full diet.

From March 13 to 16 her evening temperature averaged 100°F. During this period her pulse rate was continuously between 80 and 90 and her respirations averaged 20. When the dressing was done on March 16 the abdominal incision was found to be clean and healing well. The skin sutures and stay sutures were removed at that time.

On March 19 the patient was allowed to put her feet out of bed and on the following day she was allowed to sit up in a chair. On March 23 she was discharged from the hospital. At the time of discharge the abdominal wound was dry, clean and well healed. There was no abdominal tenderness. On bimanual examination there was no pelvic tenderness and the uterus was well involuted. The cervix was posterior and its mobility was limited. The vaults were clear. Because of the fact that the patient had shown a large trace of albumin in every specimen of urine examined since her delivery and because the sediments had shown leukocytes ranging from 2 to 18 per high-power field, she was discharged to the medical clinic for follow-up work on her kidney condition. At the time of discharge her blood pressure was 112 systolic and 72 diastolic, while her blood count showed 11,400 white and 4,720,000 red cells, with a hemoglobin of 81 per cent (Sahli).

Comment. The commonest site of rupture of the pregnant uterus is through the scar of a previous cesarean section. This is one of the reasons why an initial cesarean should be undertaken only after serious thought. It is a rule in many hospitals that no cesarean section shall be performed without consultation. This consultation, of course, should be held with an obstetrician. Spontaneous rupture of the pregnant uterus does occur even though not

associated with the scar of a previous cesarean section, but these ruptures always take place during active labor. While it is perfectly possible to have a complete separation of the placenta at seven months without previous pathology, the fact that this patient had had four previous cesareans should have been sufficient reason for the obstetrician in charge to have made the correct diagnosis long before the patient was in extremis and before the abdomen was opened. The decision not to take this uterus out in this particular case was probably a very wise one and sterilization certainly was indicated and justifiable.

INFANTILE SCURVY

Although the first description of scurvy as a disease appeared in 1260, it was not until 1668 that it was definitely described as occurring among infants. This disease, which results from a deficiency in vitamin C and is characterized by generalized bleeding, does not, under ordinary circumstances, occur in normal breast fed babies provided the diet of the mother contains enough vitamin C. However, should the mother's diet be poor, her milk will not contain the necessary amount of this vitamin and as a result the baby will develop the disease. It is for this reason that doctors often add some substance containing vitamin C, such as orange juice or tomato juice, to the diet of the nursing infant. Although the introduction of pasteurized and boiled milk as a precaution against the development of such milk-borne infections as tuberculosis and typhoid fever undoubtedly removed these dangers from the infant, it was followed by an increase in the incidence of scurvy as heating destroys vitamin C. Therefore, it is important that some substance containing this vitamin should be added to the diet of the artificially fed infant. Since boiling or prolonged heating destroys the vitamin, it naturally follows that orange juice should be neither boiled nor heated, nor should boiling water be added to the juice. The young mother who has been taught that milk, water, bottles, nipples, and so forth, must all be sterilized may easily assume that orange juice should be heated or boiled and as a result the vitamin content is destroyed and the baby develops scurvy.

Age is a definite factor in the occurrence of scurvy, the majority of cases develop during the latter half of the first year and the first half of the second year of life. After the age of one year, scurvy becomes increasingly less common, for at this period the infant's diet usually includes various foods which contain vitamin C. Season also tends to exert some influence on its occurrence, it is more frequently encountered during the winter and spring months when the herds may not be receiving fresh fodder, thereby reducing the vitamin content of the milk.

In the majority of instances the symptoms of scurvy do not appear suddenly but gradually develop over a period of several weeks until finally the typical signs of the disease are present. Early in the course of the disease the infant becomes fretful, irritable and pale, and does not like to be moved. This irritability is often first observed when the lower extremities are being handled and is due to pain resulting from bleeding beneath the outside covering of

A Green Lights to Health broadcast given by Dr. R. Cannon Eley on Wednesday May 25 and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

the bones. Any movement produces this pain, which may become so severe that the baby will begin to scream and cry from fear when anyone comes near it. This tendency to bleed is usually more likely to occur about the joints, such as the knees and ankles, than along the shaft of the bone and may cause the joint to become three or four times its normal size. In severe cases, these hemorrhages often cause the growing end of the bone to become separated from the shaft thus retarding the process of normal growth. As a result of the painful joints, the infant takes a rather characteristic frog-like position, lying motionless, flat on its back, with the thighs drawn upward, the knees bent and the legs turned outward at the hips. The gums are red, swollen, bleeding and extremely painful making it increasingly difficult for the baby to nurse, and if the teeth have been cut, dark hemorrhagic blisters or areas may appear at the point where the teeth come through the gums. Bleeding behind the eyes or around the eye socket is frequently seen and may not only cause the eye to protrude but may also give it the appearance of the well known 'black-eye'. There are often many 'black and blue' spots on the body suggesting that the infant has met with some fall or accident, and in some instances blood may appear in the urine and in the stools. As one might expect, these changes are accompanied by fever, which is often as high as 102 or 103°F, elevation in blood pressure and a more rapid pulse rate. However, in view of the fact that the present-day infants' diet is more liberal than those formerly employed, few babies suffer from complete lack of vitamin C and the more severe and advanced forms of the disease are, therefore, less frequently seen today than they were several years ago.

The diagnosis of scurvy seldom presents any great difficulty, the story of a diet inadequate in its vitamin C content and the general appearance of the baby suggest the possible presence of the disease. Even if the signs and symptoms of the well-advanced case are not present, one may employ suitable x-ray and laboratory studies which will settle the diagnosis. It is well known that an x-ray examination will show early changes in the bones that cannot be detected by the usual physical examination. Recently, chemical tests have been so perfected that the exact amount of vitamin C within the blood and the urine can be estimated, thus making it possible to discover that a baby is developing the disease long before any physical signs or symptoms are present.

Scurvy can be prevented more easily than it can be cured. Therefore, in considering its treatment we should first consider its prevention. Every infant who is fed upon boiled, pasteurized, evaporated or dried milk should also receive some substance containing vitamin C, as early as the first or second month of life. Even if the baby is nursed and the mother is receiving an adequate diet, the addition of this vitamin as a precautionary measure is worth while. Orange juice is probably the most convenient source of vitamin C and should be given in increasing amounts until the baby is taking approximately 2 oz. each day. Tomato juice offers another good source but when used should be given in amounts twice that of orange juice. Lemon or grapefruit juices may also be given but, due to their taste, are less readily taken by the baby. There are, however, some infants who refuse to take either orange or tomato juice and another group who develop rashes or other skin troubles after taking them. What can be done to prevent scurvy from developing among this group of babies? Within the past two years, vitamin C has been separated in its pure form and may be obtained from pharmaceutical houses in the form of a pill, each pill containing 25 mg., or the same amount of the vitamin C as that present in one large or two small

oranges. One of these tablets given each day to the baby will prevent scurvy. Furthermore, the price is often less than that of fresh fruit so there is really no excuse for the presence of scurvy from a financial viewpoint.

The treatment of the disease is usually simple and effective, only requiring the administration of an adequate amount of vitamin C to the baby. However, in severe cases, care should be exercised not to give too large amounts as there is reason to believe that excessive quantities may not always prove to be without danger. The results of this treatment are not only prompt but almost spectacular. Within twenty-four hours the disposition improves, the tenderness begins to disappear, joint enlargements go down, gums stop bleeding and appetite improves. However, in severe and advanced cases with poor nutrition, or in cases with other diseases such as pneumonia, death rather than recovery may be the result. Scurvy is a preventable disease. Why let it occur?

Q What is the best way of preventing scurvy?

A. The best means of preventing scurvy is by education of the public to the importance and significance of vitamin C in the infants' diet. This antiscorbutic substance is not present in pasteurized, boiled or dried milk, so it should be added to the food in some suitable form, such as orange juice or tomato juice. Recently this vitamin has been prepared commercially in the form of a tablet which is not expensive and which can be given to those infants who refuse or cannot tolerate fruit juices containing vitamin C.

Q Are scurvy and rickets due to the same vitamin deficiency?

A. No. Rickets results from a deficiency in vitamin D which is present in cod liver oil, scurvy results from a deficiency in vitamin C. However, it is not uncommon to see a baby suffering from the two diseases at the same time, for a diet that is deficient in one vitamin is often deficient in others. This is clearly shown by the fact that in a series of 314 babies with scurvy 36 were also suffering from active rickets.

Q Is scurvy primarily a disease of the poor?

A. Scurvy may occur among the rich as well as the poor if the vitamin C requirements are inadequate.

Q Is scurvy considered a common disease?

A. The series of 314 cases, previously mentioned, was seen and treated at the Infants and Children's hospitals in Boston from 1926 through 1935.

Q Did all the babies recover?

A. No. Three died from pneumonia and one died from tuberculosis.

Q At what age is the disease most likely to develop?

A. As our statistics showed, 276 of the patients were from six to twelve months of age.

Q What was the most common symptom of the babies studied in the review?

A. The majority of the babies were suffering from well-advanced scurvy, and the chief disturbance was pain when the babies' legs were even gently moved.

Q Do the hospital records show that there is as much scurvy today as there was ten years ago?

A. In 1926, there were 32 cases, in 1935 there were 39 cases. These figures seem to show that there was very little, if any, change in the amount of scurvy during the ten-year period. This can only be due to improper feeding of children, for we know what causes the disease and we know how to prevent it as well as how to cure it.

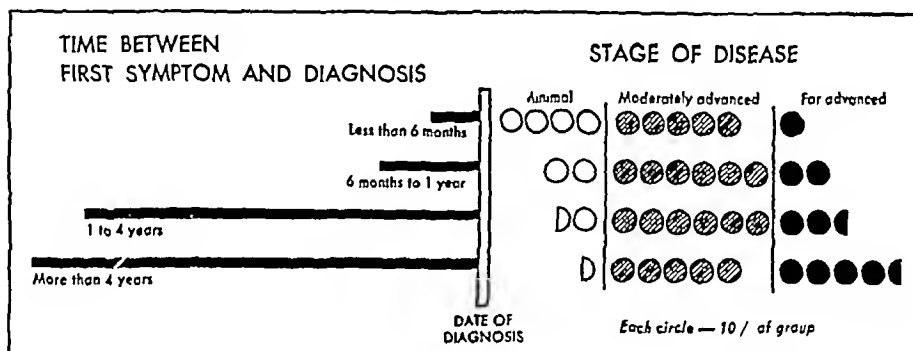
MISCELLANY

EARLY DIAGNOSIS OF TUBERCULOSIS

One measure of the efficiency of the tuberculosis campaign is the percentage of tuberculosis patients who reach the sanatorium in the minimal stage. The most extensive study yet made indicates that only about 16 per cent of sanatorium admissions are classified as minimal cases. There are several reasons why this number is so small. Two of them, namely delay in seeking advice and delay in making the diagnosis after the patient has visited the doctor, have been analyzed by Monte and Blitz (New Orleans M & S J 90 468-475, 1938) who reviewed the experiences of 300 patients under treatment in the Dibert Memorial of Charity Hospital in New Orleans.

Of the 300 white adult patients studied, less than 2 per cent were classified as in the minimal stage, 45 per

the patient to seek medical attention. In over 50 per cent of the cases, this symptom complex, although being the incentive for the visit, had been present for many months and undoubtedly was associated with constitutional symptoms of some degree. Yet these patients insisted that the accompanying symptoms were of little consequence and were not serious enough to interfere with their daily routine. True, lesions may be present in the lung parenchyma without any obvious symptoms as revealed in 5 cases reported wherein symptoms of subjective importance were absent, while roentgenological study revealed active pulmonary tuberculosis. Four of these cases were minimal, the fifth being moderately advanced. This does not necessarily imply that the number and duration of symptoms can be strictly correlated with the stage of the disease, for some of the patients volunteered the information that hemoptysis or pleurisy had been the initial symptom,



This chart is based on a study of the experience of 361 patients with tuberculosis, made by Ruth A Sedar, Social Research Series No 5, National Tuberculosis Association

cent in the moderately advanced and 53.3 per cent in the far advanced stage. Ages ranged from sixteen to seventy-eight years. Seventy-six per cent of the women and 51 per cent of the men were under thirty-five years of age.

A history of tuberculosis in the immediate family was found in 28 per cent of the series. A striking feature was that almost twice as many women as men admitted a history of tuberculosis in the family. Evidently contact with the tuberculous patient in the home is more frequent among female members of the household for they usually have the responsibility of caring for and nursing the sick.

Prior to their admission to the hospital, the diagnosis was established in 61.6 per cent of the cases, was suspected in 19.6 per cent and was not made in 18.6 per cent. The high incidence of 'suspected' cases is accounted for by the limited facilities of the average practitioner in Louisiana, and the authors believe that if the roentgen ray and laboratory aids were more widely used, diagnosis would be established in a greater percentage of cases.

The responsibility for delay in diagnosis when symptoms are present must be shared alike by the patient and the attending physician. Symptoms of a mild nature often seem negligible in the patient's estimation and thus he postpones medical consultation until more severe symptoms appear. In 2 of the 300 patients, the duration of symptoms before visiting the doctor averaged two months, and two more months elapsed before the diagnosis was established. At the end of the scale are 90 patients who delayed almost ten months before consulting the doctor and then suffered a further delay of about twelve months before the diagnosis was established.

Cough and expectoration were the most prominent initial symptoms, and these also most frequently caused

and immediate skiagrams revealed either moderately or far advanced pulmonary tuberculosis.

Of all the symptoms listed, there is little variation between the initial and presenting symptoms, with the exception of hemoptysis. As an initial symptom it was present in 9.6 per cent of the cases, whereas 22.7 per cent sought medical aid because of blood spitting. This difference in percentage indicated that although these patients had had previous symptoms a pulmonary hemorrhage was regarded with enough fear to prompt them to visit a physician.

Fever and night sweats, a combination of symptoms which in most textbooks is given a ranking position in the diagnosis of tuberculosis, were found with comparative infrequency in this series. As initial symptoms they were present in only 3.6 per cent, and as presenting symptoms, in 5 per cent of the cases.

The authors offer the following explanations for the failure in diagnosis on the basis of presenting symptoms:

Cough and Expectoration. The diagnosis was not suspected in 38.3 per cent of this group. This was probably due to the tendency on the part of physicians to diagnose prolonged or recurrent coughs as chronic bronchitis or chronic sinusitis.

Loss of Weight and Fatigability. Tuberculosis was not suspected in 50 per cent of these cases. Such diagnoses as nervousness, nervous breakdown, overwork, overindulgence in alcoholics and tobacco, dissipation, and chronic debilitating diseases were offered by the attending physician.

Hemoptysis. Blood spitting, which has been known throughout the centuries as one of the pathognomonic symptoms of phthisis, was a frequent source of error in

diagnosis Although the percentage of failure (22 1) was less than that in other groups of symptoms, it is still too high. The absence of positive physical findings on examination of the chest probably accounts for such diagnoses as ruptured blood vessel, irritation of throat, and bleeding from nasopharynx.

Pleurisy When a patient is seen only once, it is difficult to make a diagnosis unless a suspicion of tuberculosis is ever present in the physician's mind and the patient is urged to return for further observation after the acute attack subsides. Idiopathic pleuritis, though it may be accepted by the majority of physicians, should never be used as such until a sufficient interval has elapsed and the lung has remained clinically and radiologically negative. Failure to recognize this has resulted in 40.9 per cent mistaken diagnoses.

Fever and Night Sweats Climatic and endemic conditions undoubtedly are the source of confusion as regards this symptom complex. With the high incidence of malarial infection in Louisiana, it is little wonder that a number of patients were treated previously with quinine, plasmochin or Atebrine. This group leads all others in percentage of error, 73.3 per cent being neither diagnosed nor suspected.

Grippe The diagnosis was missed in 40 per cent of the group presenting symptoms ordinarily attributed to an acute respiratory infection with or without physical signs of a pneumonitis. The constant occurrence of 'flu epidemics and the failure to realize that bed rest over a short period may render a tuberculous patient asymptomatic are the natural sources of error. As in any of the aforementioned symptom complexes, suspicion of tuberculosis is of prime importance. — *Tuberculous Abstracts* June, 1938

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR MAY, 1938

DISEASES	MAY 1938	MAY 1937	FIVE YEAR AVERAGE*
Anterior poliomyelitis	0	1	6
Chickenpox	1129	1579	1134
Diphtheria	8	21	43
Dog bite	1107	1223	1066
German measles	74	259	2269
Gonorrhea	366	486	488
Lobar pneumonia	475	434	380
Measles	1350	2953	3800
Meningococcus meningitis	4	31	15
Mumps	977	747	953
Paratyphoid B	20	61	17
Scarlet fever	1525	976	1081
Syphilis	507	534	441
Tuberculosis pulmonary	178	267	324
Tuberculosis other forms	13	20	39
Typhoid fever	1	4	10
Undulant fever	2	1	3
Whooping cough	478	1220	817

*Based on figures for preceding five years

RARE DISEASES

Diphtheria was reported from Boston, 2, Lexington, 1, Salem, 2, Watertown, 1, Worcester, 2, total, 8

Dysentery bacillary, was reported from Cambridge, 1, Danvers, 9, Springfield, 4, Wellesley, 1, Woburn, 5 total, 20

Meningococcus meningitis was reported from Boston, 1, Haverhill, 1, Quincy, 1, Worcester, 1 total, 4

Paratyphoid B was reported from Brookline, 9, Braintree, 1, Fall River, 8, Newton, 1, Sharon, 1, total, 20

Pfeiffer bacillus meningitis was reported from Beverly, 1, Gardner, 1, Worcester, 1, total, 3

Septic sore throat was reported from Amherst, 2 Beverly, 3 Boston, 8, Cambridge, 1, Everett, 1, Greenfield, 1,

Salem, 3, Southbridge, 1, Sturbridge, 1, Wakefield, 1, total, 22

Trichinosis was reported from Springfield, 1

Typhoid fever was reported from Boston, 1

Undulant fever was reported from East Bridgewater, 1, Millis, 1, total, 2

Diphtheria was reported at a record low figure.

Scarlet fever, mumps and lobar pneumonia were reported above the five year average.

The reported incidence of tuberculosis (other forms) showed record low figures both for this and any other month ever recorded

The reported incidence of German measles showed record low figures

Chickenpox, whooping cough and measles were reported below the five year average.

Except for May, 1934, which was equalled, meningococcus meningitis showed record low incidence.

The incidence of undulant fever was not remarkable.

The figures for pulmonary tuberculosis showed record low incidence.

Paratyphoid B fever continued to be reported at a high figure.

Typhoid fever showed record low incidence.

The reported incidence of dog bite was maintained at a fairly high figure. Several cases of animal rabies were reported throughout the state. Previously reported foci in Westborough, Malden, Sutton and Andover were active. A new focus was noted in Grafton.

CORRESPONDENCE

HOW DeQUINCEY BECAME AN OPIUM ADDICT

Among the books on DeQuincey none is more interesting than the biography by Horace Ainsworth Eaton (Oxford University Press, 1936)

Eaton tells us that in 1804 DeQuincey came up to London, from Worcester College, Oxford. He took lodgings, and for some reason not explained, omitted the complete washing of his head in cold water, which he was accustomed to take. He was suddenly seized with a most violent toothache, which he attributed to this omission. 'He jumped out of bed and plunged his head in a basin of cold water, and with hair thus wetted went to sleep'. The next morning he suffered the most excruciating facial neuralgia, we are told, which kept up for three weeks. Nearly frantic with the pain he walked out one day and met a college acquaintance. DeQuincey told him of his constant misery and the student recommended that DeQuincey take opium for the pain. Near the Pantheon he found a druggist, who gave him some laudanum, with directions how to take it. DeQuincey stated in the *Confessions* that in all his wanderings about London he was never able to find the same druggist again. In an hour there was marvelous relief from the pain, and later a stage of both mental and physical stimulation became apparent. After a time, DeQuincey was accustomed to call for a glass of laudanum negus, warm, without sugar" every day. He took laudanum eight years continuously. We are told that from his own account he arose to the astonishing amount of 8000 drops of laudanum, or about 7 wine glasses. After a time he was able to reduce to 1000 drops a day.

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REPORTS OF MEETINGS

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital on March 27. Dr. C. Guy Lane presided.

The first case presented was that of a forty-seven-year-old Swedish woman, who entered complaining of pain and a lump in the left axilla of two months' duration. Three months before entry a small skin lesion had developed on the left index finger. This had been followed a week later by lymphangitis, and a month before entry, red, tender papules came out on both forearms. These continued to appear, and each lesion lasted about three weeks. Coincidentally a lump appeared in the left axilla. Five days before entry, burning of both eyes with photophobia was noticed. Physical examination showed injection of the conjunctivae and considerable lacrimation. There was a lemon-sized, soft, slightly tender mass in the left axilla, which was fixed to the skin. Ten to fifteen, round, erythematous purplish papules were seen on both forearms, chiefly on the dorsal aspect. The routine laboratory examinations were negative except that a blood Hinton test was positive. The case was presented as an example of erythema multiforme.

The second case was that of a seventeen-year-old salesgirl, who had presented ulcers on the lower legs for the past four years. These recurred each winter after the first snow and always healed in the summer, leaving round pigmented areas. The physical examination was negative except for punched-out ulcers about 1 cm. in diameter. There was some surrounding induration and a diffuse brownish red pigmentation of the legs and scars of previous ulcers. The laboratory work was negative. The skin temperature readings were considerably increased during spinal anesthesia. Normally her feet were very cold. Dr. John Homans discussed this patient and considered her as a probable example of erythema induratum. He has treated such cases by sympathectomy, with good results. The question arose as to whether the temperature of the lower extremities would be permanently elevated by such measures. Dr. Homans reported that the ulcers always healed after this procedure. Dr. Lane discussed the important features of erythema induratum.

Dr. Edward A. Edwards spoke on "The Pigments and Color of Living Human Skin." Not only is the normal eye incapable of accurate color judgment, but in addition, 4 per cent of the population are color blind, and 30 per cent subaverage in their response to color. In many diseases it is desirable to have an objective record of the skin color. The data for this specification can be obtained instrumentally by the Hardy recording spectrophotometer. This instrument measures the reflection of light at each wave length of the visible spectrum. Not only does the curve obtained give bases for color specification, but also, by observing the absorption bands present, one can identify the factors responsible for skin color.

Five pigments and one additional optical effect were found to give skin its color. The pigments are melanin, melanoid (a derivative of melanin), oxyhemoglobin, reduced hemoglobin, and carotene. The turbidity of the deeper portions of the epidermis adds a blue component to the reflected light through the optical process called scattering. These factors were studied in the curves obtained from normal adult subjects in the hope that this would form a basis for future work in disease.

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Transmission curves were shown of reduced and oxyhemoglobin and their differentiating absorption bands pointed out. In the spectrophotometric curves strong evidence of oxyhemoglobin pointed to a rich arterial supply or a fast rate of blood flow, while marked evidence of reduced hemoglobin pointed to the presence of large veins or a sluggish blood supply. Arterial blood is most prominent in the skin of the palms, soles, head and neck, and over the ischial tuberosities. Venous blood predominates in the skin of the lower trunk and scrotum and on the dorsa of the feet.

Carotene was shown to influence skin color. It was proved to be located in the subcutaneous fat, as well as in the stratum corneum of the epidermis. Its distribution in the skin resembles that of arterial blood.

The scattering of the deeper, turbid layers of the epidermis varies according to the thickness of these layers. However, it is hard to map out the regional variations in scattering because wherever the epidermis is heavy the melanoid is likewise increased and raising of the blue end of the spectrum by scattering is offset by the absorption of melanoid. Conversely, of course, it is difficult to determine the distribution of melanoid.

Women have less evidence of melanin and blood in their skins, but show much greater evidence of carotene than do men. Carotene is particularly plentiful in the skin of the abdomen, breasts and buttocks—regions that contain but little in men.

The characteristic color of the dark subjects studied (Hindu, Japanese, mulatto and Negro) seemed to be due entirely to the amount of melanin present. They showed no differences in the amount or distribution of the other normal pigments, or evidence of any pigments not found in Whites.

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the present time. He pointed out that the mortality rate for all the treatable types has dropped to encouragingly low levels. He discussed the increasingly complex nature of the various branches of the pneumonia service, and pointed out the pressing need at the present time for further facilities for diagnosis, treatment and investigative study.

The second paper was presented by Dr Theodore L. Badger, entitled "The Significance of the Negative Tuberculin Reaction in Young Adults." Dr Badger discussed the results of a study on a series of tuberculin tested nurses at the Boston City Hospital, among whom 57 per cent were found to be tuberculin positive. In the entire group, 8 cases of pulmonary tuberculosis developed. Only 1 of these occurred in the tuberculin positive group, the other 7 cases were in nurses who had been tuberculin negative at the onset of their training. The ages were between eighteen and twenty three years. Several types of onset were encountered, among which were (1) primary type with enlarged hilar nodes and mid lung parenchymal involvement, (2) single apical lesions, and (3) long-continued fever with small parenchymal lesions, followed by pneumonic tuberculosis in one apex. All these cases were found following the appearance of a positive tuberculin reaction. Other investigators, including Heinbeck, Amberson and Myers, have noted the greater susceptibility to tuberculosis in negative reactors.

The third paper was read by Dr John A. Foley, who presented the case of a seventeen year-old girl who entered the hospital complaining of multiple joint pains for five weeks. Following entry, she developed a diffuse erythematous rash, ran a constantly elevated temperature, and exhibited a generalized lymphadenopathy. Subsequently she developed effusions in both pleural cavities. A diagnosis of disseminated lupus erythematosus was considered as a possibility. Biopsy of a lymph node proved negative for tuberculosis histologically, but subsequently a guinea pig inoculation with lymph node material was found to be positive.

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The study revealed that of the abscesses occurring post-operatively, the largest number followed tonsillectomy. However, the number of tonsillectomies far exceeded all other types of operation performed, and actually the incidence of abscesses following tonsillectomy was lower than that for other operations. In this group, the ratio of incidence of abscesses to operation was 1:1654, in children, the ratio was 1:8852, and in adults, 1:626. The lowest incidence occurred following local anesthesia.

It was concluded that the chief factors in the incidence of postoperative abscesses were the presence of infection in the upper or lower respiratory tract, the type of anesthesia, the prolonged retention of aspirated material, the development of atelectasis, an infective source, and limitation of pulmonary ventilation. The question of whether abscesses arise from aspiration or embolism remains unanswered, but evidence seems to favor the former as the chief cause. The location of most postoperative abscesses was found to be in the right lower lobe, near the proximal portions of the bronchial tubes. Satisfactory experimental abscesses have not been produced in animals by either mechanism.

Medical conditions leading to abscess formation far exceeded in number the postoperative abscesses. Pneumonia, influenza, chronic suppurative conditions, tumors and atelectasis from any cause were the chief conditions encountered.

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REPORTS OF MEETINGS

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital on March 27. Dr. C. Guy Lane presided.

The first case presented was that of a forty-seven year-old Swedish woman, who entered complaining of pain and a lump in the left axilla of two months duration. Three months before entry a small skin lesion had developed on the left index finger. This had been followed a week later by lymphangitis, and a month before entry, red, tender papules came out on both forearms. These continued to appear, and each lesion lasted about three weeks. Coincidentally a lump appeared in the left axilla. Five days before entry, burning of both eyes with photophobia was noticed. Physical examination showed injection of the conjunctivae and considerable lacrimation. There was a lemon sized, soft, slightly tender mass in the left axilla, which was fixed to the skin. Ten to fifteen, round, erythematous purplish papules were seen on both forearms, chiefly on the dorsal aspect. The routine laboratory examinations were negative except that a blood Hinton test was positive. The case was presented as an example of erythema multiforme.

The second case was that of a seventeen year-old salesgirl, who had presented ulcers on the lower legs for the past four years. These recurred each winter after the first snow and always healed in the summer, leaving round pigmented areas. The physical examination was negative except for punched-out ulcers about 1 cm. in diameter. There was some surrounding induration and a diffuse brownish red pigmentation of the legs and scars of previous ulcers. The laboratory work was negative. The skin temperature readings were considerably increased during spinal anesthesia. Normally her feet were very cold. Dr. John Homans discussed this patient and considered her as a probable example of erythema induratum. He has treated such cases by sympathectomy, with good results. The question arose as to whether the temperature of the lower extremities would be permanently elevated by such measures. Dr. Homans reported that the ulcers always healed after this procedure. Dr. Lane discussed the important features of erythema induratum.

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Five pigments and one additional optical effect were found to give skin its color. The pigments are *melanin*, *melanoid*, a derivative of melanin, *oxyhemoglobin*, *reduced hemoglobin*, and *carotene*. The turbidity of the deeper portions of the epidermis adds a blue component to the reflected light through the optical process called *scattering*. These factors were studied in the curves obtained from normal adult subjects in the hope that this would form a basis for future work in disease.

Melanin is present in granules in the deep layers of the epidermis. They are fewest in blond Whites, increasing

in brunettes, and present in large amounts only in the skin of dark races. Melanin was extracted from the skin of a Negro and transmission curves were made of this substance in varying concentration. As the concentration varies, the color changes from a brown to a yellow, and finally to an orange red. This corresponds to color changes seen in the various races. Except for melanin formation, which is induced by exposure to sunlight, it follows a very definite pattern, which was shown in chart form. It is richest in the skin of the scrotum and areolae mammae, fairly rich in that of the axilla and perineum, and only slight in amount in that of the palms, soles, breasts and buttocks. It is low in the skin of the trunk, increasing dorsally from the scapular to the lumbar regions.

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O'Shaughnessy, which open up a promising field in the treatment of cardiac disease.

The esophagus has been termed the "last frontier of surgery." Several new operative methods of treating carcinoma of the esophagus have been devised which may eventually prove to be successful.

Dr Strieder presented a series of lantern slides to demonstrate operative procedures for a variety of chest diseases, including carcinoma, bronchiectasis and tuberculosis. He then exhibited a case of a young man who had entered the hospital with cardiac tamponade resulting from a stab wound, he was immediately relieved by a pericardial tap and the removal of blood. No operation was found necessary, and bleeding has not recurred.

The papers were discussed by Dr Horace Binney, who also presented a summary of progress in the operative treatment of tuberculosis at the Boston Sanatorium. Thoracoplasty has proved to be of increasing value, both in arresting the disease and in preventing new infections by the closure of cavities. Since its introduction the total mortality from tuberculosis has appreciably dropped.

GREATER BOSTON MEDICAL SOCIETY

The Greater Boston Medical Society met Tuesday evening, April 5, at the auditorium of the Beth Israel Hospital, in Boston. The speaker was Dr Louis Nahum, assistant professor of medicine, the Yale University School of Medicine. His subject was "Comments on the Coronary Arteries from the Clinical Standpoint, with Special Reference to Prognosis." Dr Louis M. Freedman, of Boston, presided.

The myocardium is considerably more sensitive to lack of oxygen than skeletal muscle. This fact is brought out by the observations of Katz and Long. They found that the heart will go into rigor when it has accumulated 70 mg per cent of lactic acid. This is about one quarter of the quantity necessary to initiate rigor in skeletal muscle.

There are two mechanisms for increasing the oxygen supply to the heart muscle: (1) vasodilatation from increased cardiac activity and (2) greater vascularity of myocardial fibers. The first fact is not generally recognized. The second is borne out by the observation that each myocardial fiber is supplied by two capillaries, while each skeletal muscle fiber is supplied by only one.

The maximum blood supply which a heart can receive is about three times normal, that is, up to 700 cc. per minute. If coronary-artery disease is present there may be a great discrepancy between work and blood supply.

The heart has two venous systems. One is the gross system, including the coronary sinus and other larger veins. The other consists of the Thebesian vessels. The two systems facilitate a greater blood flow through the system.

In the arterial system there are two sets of collaterals—the extrinsic and intrinsic. The former plays a very small part normally. It is derived from the aorta and the bronchial, pericardial and internal mammary arteries. The intrinsic collaterals are of greater importance and consist of (1) anastomoses between the right and circumflex branches of the left coronary arteries, (2) terminal anastomoses of arteries, (3) small vessels in epicardial fat which connect one part of a coronary artery with another part, and (4) Winternitz's intimal sinusoids, which may become of extraordinary significance. Perhaps these vessels carry adequate blood supply in cases of complete coronary occlusion, as in the cases of Leary and Wearn.

In studying cases with coronary artery disease one finds a variety of clinical pictures. This is not entirely depend-

ent on the degree of involvement, for there are cases with marked lesions and a minimum of symptoms. The reverse is likewise true. The factors responsible for the diversity of clinical pictures are (1) the state of the collateral channels, (2) the rate of progression of the arterial disease, and (3) the appearance of an accident, that is, closure.

Dr Nahum summarized the present ideas of Dr Winternitz relating to the cause and progression of arteriosclerosis. With the technic of arterial clearing Dr Winternitz showed hemorrhages in the intimas of normal arteries. This is interpreted as being due to a rupture of intimal sinusoids. The hemorrhage may be so slight as to cause no change or it may be extensive and raise the intima from a slight degree to the point of complete closure. The liberated lipid from the hemorrhage becomes calcified.

At times the intimal hemorrhage will rupture into the lumen. The resulting raw intimal surface predisposes to the development of thrombosis. The initiation of thrombosis is not necessarily followed by complete closure of the vessel lumen. Indeed, it may take as long as two weeks for complete closure.

Predisposing factors to the development of arteriosclerosis were next considered. They are as follows: (1) sex—in Dr Nahum's series of patients with coronary artery disease only 25 per cent were women, (2) diabetes—almost all cases of uncontrolled diabetes for a period of five years have generalized arteriosclerosis, (3) body weight—this seems to be an important factor, for coronary-artery disease is two and a half times more common in people who are overweight than in those who are not, and (4) hypertension—nearly everyone who has had hypertension for any length of time has arteriosclerosis.

About 40 per cent of the patients with clinical coronary artery disease are likely to develop clinical infarction following thrombosis. Thrombosis is an accident and is generally unpredictable. In an attempt to forestall thrombosis one can advise increased rest and loss of weight. Some believe this helps. Drugs seem to be rather discouraging in this respect. Activity within comfort does not seem to increase the tendency to the development of thrombosis. It would seem that overexertion can be responsible for development of this accident. Several cases were cited in which overexertion seemed to have played a positive role. If overexertion is to be blamed for an attack of coronary thrombosis, there must be exertion beyond ordinary capacity and a reasonable interval between the effort and the thrombosis.

There are several clinical factors which may be used in attempting to estimate the size of a myocardial infarct. It is usually in inverse proportion to the efficiency of the heart. Thus one would expect a small infarct if the pulse is good, the respirations not altered, and the lungs without congestion. Slight or absent fever and no appreciable fall in blood pressure are likewise good signs. The reverse, however, indicates a larger infarct and a consequent, graver prognosis.

Since the length of induced invalidism should depend on the size of the infarct it is important to be able to judge the latter. Having determined this fact one can attempt to determine the length of time needed for the infarct to heal. The smaller infarcts are probably healed in three weeks, the larger ones may take as long as three months.

Factors other than size which influence the time of healing are anemia and avitaminosis. One should attempt to correct or prevent these conditions in every case of

coronary thrombosis with myocardial infarction. It is doubtful whether any drug at one's disposal influences the healing of infarcts. The theobromine group seems to be of no help. Dr Nahum has abandoned the use of intravenous glucose. Morphine should be used, as necessary, to abolish pain. Early recognition of the condition and prompt immobilization of the patient are two measures preventing fatalities. Rest should consist of mental and physical quiet, the diet should be reduced, for cardiac output increases with large meals.

In myocardial infarction the electrocardiogram is frequently a specific diagnostic procedure, much as the x ray is in fractures or tuberculosis.

The discussion was carried on by Drs Ayman, Schlesinger, Morrison, Blumgart and Riseman. It was brought out that in cases of myocardial infarction it is common to find more than one vessel occluded. Presence or absence of infarction depends more on the rate of occlusion than the size or number of vessels occluded. A factor which tends to initiate coronary thrombosis is lowered blood pressure. Examples are cases occurring during spinal anesthesia and following severe hemorrhage from peptic ulcer.

In closing the discussion Dr Nahum brought out the fact that survival depends on the size of the infarct rather than the age of the patient. Development of collateral circulation depends not on age but on the presence of arteriosclerosis. The ultimate outcome depends on which of these factors develops faster.

NOTICES

MEDICAL LIBRARY ASSOCIATION

The fortieth annual meeting of the Medical Library Association will be held at the Hotel Somerset, Boston, June 28 to 30. Sessions will be held at the Boston Medical Library and Harvard Medical School, with open house in the libraries of the city.

The speakers will be Dr Henry R. Viets, of Boston, Dr Sanford V. Larkey, of Baltimore, Dr John F. Fulton, of New Haven, Connecticut, and Mrs Eileen R. Cunningham, Miss Isabelle T. Anderson, Mr James F. Ballard and Mr Herman H. Henkle.

Symposiums on a Guide to Medical Literature and Medical Literature of the Past will also be featured.

CAMBRIDGE HOSPITAL

The regular clinicopathological meeting of the staff of the Cambridge Hospital will be held at the hospital, 330 Mt. Auburn Street, Cambridge, Tuesday, June 21, at 8 p. m.

All members of the medical profession are cordially invited to attend.

JOSEPH M. WADDEN, M.D., *Secretary*

CARNEY HOSPITAL

The monthly clinical meeting and luncheon of the Carney Hospital will be held in the Andrew Carney Assembly Room on Monday morning, June 20, at 11 30.

There will be medical, surgical, gynecological, obstetrical and urological case reports.

Physicians and medical students are cordially invited.

R. J. HEFFERNAN, M.D., *Secretary*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JUNE 20

TUESDAY JUNE 21

- *10 a. m. 12 30 p. m. Tumor clinic Boston Dispensary
- 12 m. South End Medical Club Headquarters of the Boston Tuberculosis Association 554 Columbus Avenue Boston

WEDNESDAY JUNE 22

- *8 15 p. m. New England Heart Association Ether Dome of the Massachusetts General Hospital

FRIDAY JUNE 23

- *10 a. m. 12 30 p. m. Tumor clinic Boston Dispensary

SATURDAY JUNE 24

- *10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital Conducted by Dr Henry A. Christian

- *Open to the medical profession

- JUNE 20—Carney Hospital Notice above
- JUNE 20-24—Canadian Medical Association Page 902 issue of May 26
- JUNE 21—South End Medical Club Page 988 issue of June 9
- JUNE 21—Cambridge Hospital Notice above
- JUNE 21—Lawrence Cancer Clinic. Page 988 issue of June 9
- JUNE 22—New England Heart Association Page 988 issue of June 9
- JUNE 23—Pentucket Association of Physicians Duck In Merrimack 8 30 p. m.
- JUNE 28-30—Medical Library Association Notice above.
- SEPTEMBER 12 14—American Association for the Study of Gout Page 545 issue of March 24
- SEPTEMBER 12 15—American Congress of Physical Therapy Page 946 issue of June 2
- OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 282 issue of February 10
- OCTOBER 17 21—Clinical Congress of the American College of Surgeons New York City
- OCTOBER 24 26—Academy of Physical Medicine, Scientific Session Washington D. C.

DISTRICT MEDICAL SOCIETIES

HAMPDEN

Meeting will be held on the fourth Tuesday in July

PLYMOUTH

Meeting will be held at 11 a. m. on July 21

BOOK REVIEWS

Handbook on Social Hygiene Edited by W. Bayard Long and Jacob A. Goldberg. 422 pp. Philadelphia: Lea & Febiger, 1938. \$4.00

This handbook is a very complete, well planned and well written contribution concerning some of the problems of social hygiene. The first half takes up in some detail the treatment of syphilis and gonorrhea. The treatment of syphilis is considered under various headings, such as syphilis of the nervous system, and prenatal and congenital syphilis. There are chapters on gonorrhea in the male, gonorrhea in the female, and vaginitis. One chapter is devoted to laboratory aspects of these diseases.

The second half of the book is concerned with the social aspects of gonorrhea and syphilis. There is an excellent chapter by Dr. Munger on hospitals and outpatient clinics. In this chapter, the contributor condemns the policy followed by many hospitals of refusing to admit patients with these diseases.

The public-health point of view is presented by Dr. Clarke, who makes the statement that all cases with infectious syphilis should be hospitalized until they become non-infectious.

An interesting chapter is one by Dr. Goldberg on statistics relating to syphilis and gonorrhea. Other chapters deal with social service, the responsibility of nursing schools, the public health nurse and syphilis control, and the prob-

lems of syphilis and gonorrhea in family welfare agencies. The ideals of the social hygiene societies are well stated in a chapter by Dr. Bigelow, and another chapter gives the legal aspects of the venereal diseases, including a section on marriage laws.

From the preceding outline, it will be seen that the subject is covered from many angles—medical, social and legal. The handbook is a valuable book for reference and will serve well as a textbook for students.

Scientific Contributions in Honor of Joseph Hersey Pratt on His Sixty-Fifth Birthday. Anniversary Volume. By his friends. 983 pp. Lancaster: Lancaster Press, Inc., 1937. \$7.00.

Those of us who admire Dr. Joseph H. Pratt will like this book, and if it is true that a man can be judged by his friends, even the most critical will agree that Dr. Pratt has achieved much honor in the medical profession, for his friends, as the book testifies, are scattered so eminently all over the world.

The most outstanding feature of the volume is its list of contributors. This consists of a group of one hundred twelve writers beginning with Joseph C. Aub and jogging on comfortably through the alphabet to Robert W. Wilkins. Almost every name well known to modern medicine appears, and, of course, old friends of Dr. Pratt's like Richard Cabot, Henry Christian, Frank Fulton, Louis Hamman, Elliott Joslin, Samuel Lambert, Warfield Longcope, David Riesman and Walter Steiner—to mention a few—have written articles for it.

All the pages that make up the book are friendly, well printed and happily edited. The topics discussed cover almost every phase of medical thought from "The Minneapolis Giant" to "The Effect of Vitamin C on the Culture of H37 Tubercle Bacillus" or from "Metabolic Studies in a Man Who Lived for Years on a Minimum Protein Diet" to "Marcus Whitman and Narcissa Prentiss—A Study of Romance, Adventure, Achievement and Tragedy." The charm of it all lies in the delightful manner in which so many of Dr. Pratt's friends have written something in honor of his sixty-fifth birthday, not because they were asked to but for the joy of paying him a nice compliment.

Thus the book is unusually attractive. It colors and adds background to Dr. Pratt's photograph which appears as a frontispiece, to the list of his own published works, to the short biographical sketch of him that opens the book, and to the description of the New England Medical Center that ends it. No better characterization of a man's knack at making and holding friends could be devised than this volume. A doctor so gifted in the art of friendship must indeed be a great physician. It is pleasant to have on record such a significant portrait.

An Introduction to Dermatology. Richard L. Sutton and Richard L. Sutton, Jr. 666 pp. Third edition. St. Louis: The C. V. Mosby Company, 1937. \$5.00.

The third edition of the 'small Sutton has been improved considerably. Much new material and numerous new illustrations have been added. A number of skin conditions to which new names have been attached are covered in this third edition. Syphilis has been given more consideration with the work of the Co-operative Clinic Group included, and more attention paid to treatment. Treatment in general has been amplified. The arrangement of the book has been improved by the attempt to follow more closely a classification on etiology. On the whole the book provides, in a relatively small space,

abundant information about cutaneous disease for the student and general practitioner. The illustrations are excellent, with a few exceptions, and clearly show conditions which much description would fail to describe satisfactorily to the reader.

The Endocrines in Obstetrics and Gynecology. Raphael Kurzrok. 488 pp. Baltimore: The Williams & Wilkins Company, 1937. \$7.50.

In less than 500 shiny pages printed in large easily readable type, Kurzrok has successfully attempted to present the current theories and facts, as well as some of the fancies, of the endocrines in their relation to general medicine. Just enough of the historical and anatomical background is given to afford a take-off.

The prodigious mass of literature on experimental biology of the sex-endocrines is expertly sifted and only that pertinent to rational diagnosis and organotherapy included. Into chemistry, however, the author takes the clinical reader way over his head where he finds himself among intricate benzene rings which even with many double bonds do not serve as lifesavers. Yet the passages must not and need not be avoided, for floating through them are the *ones*, *ols* and *ins* as well as the *APLH's*, the *FSH's* and the *LH's*, that are the logs out of which the reader is enabled with surprisingly little effort to build a resounding raft which may save his therapeutic life.

The ill understood but well recognized influence of the thyroid and the adrenal glands on reproductive processes receives moderate and conservative attention, as do also some of the current notions about the pancreas, the thymus and the parathyroid glands. Menstruation, in order and disorder, and ovulation, too, are considered in such detail that any experienced reader may find much with which to disagree. On this, as on other subjects, and especially on chemistry, the author freely (and properly so) presents his own theories and a great deal of his own original work, with which there is not complete agreement from other workers in the field. This need cause no confusion, however, for the text abounds in tact and modesty, and when no one knows the answer to a problem, intelligent and informal discussion is the best substitute for the missing solution. This very instructive book will answer, at least temporarily, the prayer of the clinician distressed by the rapid growth of sex-endocrinology and the insistent demand for organotherapy.

Psychiatric Nursing. William S. Sadler, in collaboration with Lena K. Sadler and Anna B. Kellogg. 433 pp. St. Louis: The C. V. Mosby Company, 1937. \$2.75.

This book has much valuable information in it. It attempts to cover too much ground, however. The author inadequately presents historical developments in psychiatry, a bit of neuroanatomy, an inadequate picture of mental disease including some references to the etiology, prognosis, and treatment, a bit of occupational therapy, and mentions helio- and hydrotherapy with pictures of their application.

The author would have done better to have confined himself to subjects more germane to psychiatric nursing. Trying to carry water on so many shoulders at once has resulted in unnecessary spilling. Had the author confined himself to the technics essential for a well trained nurse to add to her armamentarium to qualify as a psychiatric nurse for mental cases the book would have been more readable and valuable.

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TREATMENT OF PNEUMOCOCCIC MENINGITIS

A Study of Ten Cases Treated With Sulfanilamide Alone or in Various Combinations With Specific Antipneumococcic Serum and Complement, Including Six Recoveries

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ALBERT E. RAUH, M.D.‡

BOSTON

WE have had the opportunity, during the past few months, to study intensively a number of cases of pneumococcic meningitis treated with sulfanilamide alone or in various combinations with specific antipneumococcic serum and fresh human serum (complement). In this paper we are presenting a group of cases illustrating certain aspects of these studies. The immediate interest in these cases concerns 6 patients who recovered. The method of treatment tentatively evolved and the one which thus far has given the most favorable results as judged by the clinical response and the laboratory findings in this small group of cases will be described. This method is based upon the results of clinical, bacteriological and immunological studies in patients with pneumonia and other pneumococcic infections, including meningitis, and upon more recent investigations of the mechanism of the action of sulfanilamide, alone or in combination with specific serum, on pneumococci in human blood (in vitro) and in patients undergoing treatment for pneumococcic infections. The details of these studies are left for separate consideration elsewhere. It will suffice to enumerate here the pertinent findings which provided the rationale for the present approach.

It may be stated at the outset that a number of studies in some of the present cases have not yet been completed. Moreover, it is felt that

further observations, in a larger number of cases, are necessary before final conclusions can be drawn with regard to the principles involved, and the relative importance of each of the various steps and agents used in the treatment. It will also be essential to assess the quantitative aspects of the treatment, the various types of cases in which this method of therapy is applicable and effective, and the importance of other therapeutic measures. At this time no attempt will be made to review the numerous papers on pneumococcic meningitis that have appeared in the recent literature. These are concerned chiefly with clinical reports of isolated cases recovering either spontaneously or after various surgical measures, after specific therapy or, more recently, after treatment with sulfanilamide ‡

RÉSUMÉ OF BACTERIOLOGICAL AND IMMUNOLOGICAL FINDINGS IN CASES OF PNEUMOCOCCIC MENINGITIS

The clinical and bacteriological data have been accumulated in the course of several years' study of pneumonia and pneumococcic infection at the Boston City Hospital. The distribution of specific types in 99 cases of pneumococcic meningitis occurring at this hospital between November, 1929, and June, 1936, has been reported elsewhere.¹ There was no striking predominance of any types among these cases with the exception of the high frequency of Type III in cases complicating middle-ear and mastoid infections. None of these or of the subsequent cases recovered except the 6 to be described.

The numbers of pneumococci recovered from the cerebrospinal fluid in untreated cases of pneumococcic meningitis have usually been large and have frequently reached the numbers found in

*Presented before the Section of Medicine, Massachusetts Medical Society, Boston, June 2, 1938.

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Neurosurgical Service and Neurological Unit, Boston City Hospital, and the Department of Medicine, Harvard Medical School, Boston, Mass.

This study was aided, in part, by a grant given in honor of Francis Weld Peabody by the Ella Sachs Plotz Foundation.

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†The exhaustive review by Holman, W. L., and Duff, G. L. (Am. J. M. Sc. 1935;39:416, 1935), contains references to most of the recent papers dealing with sulfanilamide in pneumococcic infections.

pure cultures of these organisms when grown in the most favorable fluid medium (from 1 to 1000 million living pneumococci per cubic centimeter of spinal fluid). Along with these organisms there is found a considerable amount of specific precipitable substance.

Two groups of immunological studies have been conducted. One concerned antipneumococcic immunity, natural and acquired. Many of these studies have been conducted along the lines indicated by the work of Ward² and Robertson³ and their respective co-workers whose findings were confirmed and extended. It was found that, for the destruction of pneumococci, three components are essential: specific antibodies, an adequate number of living phagocytic leukocytes, and a heat-labile factor (complement) residing in the serum. Except in infancy, most human beings have what might be called "natural antibodies" in that their blood is capable of destroying large numbers of many types of virulent pneumococci. These natural antibodies, however, are not associated with demonstrable type-specific agglutinins or with antibodies capable of protecting mice against otherwise fatal doses of pneumococci. The latter have been demonstrated only after immunizing contact with living pneumococci or with their antigenic components, that is, after infection, active immunization or the carrier state. These acquired antibodies seem to play an essential role in the mechanism of recovery from pneumococcic infections.

The second group of studies concerned patients with meningitis and were, for the most part, an application of the results of the investigations on pneumococcic immunity to studies similar to those on influenzal meningitis made by Ward and Fothergill.⁴ Only the salient findings need be mentioned.

We have not succeeded in demonstrating the presence of complement in the cerebrospinal fluid (0.4 cc was the largest amount of fluid used) from untreated cases of pneumococcic meningitis, with one exception. In this case, with infection due to Type VII pneumococcus, the first observation was made on cerebrospinal fluid obtained after the patient had received antimeningococcic serum intraspinally. Both the blood and spinal fluid had unusually high titers of specific Type VII antibody (mouse protection and agglutinins) at the time of this observation. This patient died several weeks later after multiple operations for brain abscesses. When fresh human serum was introduced intraspinally in active cases, the complement could not be demonstrated after the lapse of a few hours.

Patients with pneumococcic meningitis, like those with other focal pneumococcic infections, frequent-

ly have demonstrable specific antibodies (opsonins, agglutinins and mouse protection) for the homologous type in their circulating blood, provided there is no bacteremia. In meningitis associated with vegetative endocarditis, however, bacteremia and high titers of circulating homologous type-specific antibodies may coexist. No such antibodies can be demonstrated in the cerebrospinal fluid at the same time, except under unusual circumstances such as in the case just mentioned.

We have not been able to demonstrate pneumococcus antibodies (agglutinins or mouse protection) in the cerebrospinal fluid after the intravenous injection of antipneumococcic horse or rabbit serum, either in the presence or absence of meningitis.

Studies on the action of sulfanilamide have shown that, when this drug is added to whole defibrinated human blood in appropriate amounts, it has a moderate to marked bacteriostatic action on most of the strains and types of pneumococci tested. This action fails or is only slight in the blood of certain patients with pneumococcic infections, particularly if the blood stream is heavily invaded. Similar amounts of sulfanilamide markedly enhance the pneumococcidal action of immune serum (horse and rabbit) added to whole blood in vitro, even when the blood of a heavily invaded patient is used. The bacteriostatic and bactericidal action of the whole blood of patients with pneumococcic infections after receiving treatment with sulfanilamide or with this drug and immune serum is identical with that of the blood taken before treatment and tested after the addition of equivalent amounts of these materials in vitro.

In cases of pneumococcic meningitis the bacteriostatic action of sulfanilamide is evidenced by a rapid reduction in the number of organisms that can be cultured from the cerebrospinal fluid and apparent cessation of multiplication, at least for a considerable period after treatment is begun. With the reduction in the numbers of organisms there is a rapid rise in the sugar content of the cerebrospinal fluid, even while the infection persists and sometimes even in the presence of large numbers of organisms. If frequent punctures are done, the protein content of the fluid and the number of leukocytes may also drop markedly while the infection is still present. In some cases the infection clears up with this treatment alone after a varying length of time, usually ten days or more. It is possible that with proper doses this result can be attained more regularly and with many strains of pneumococci, but in most of the cases of our series, in which ordinary dosages were employed, the infection persisted and eventually increased.

again. These aspects and others are brought out more effectively in the case reports.

Certain other inferences and assumptions have been invoked in working out a rational method of therapy. These are based, in part, on the results of test-tube experiments and on what might be called "clinical impressions" from observations of the consequences of certain modes of therapy used in the past.

It may be assumed that, if any considerable quantity of a highly potent specific therapeutic serum is introduced into the spinal canal in an otherwise untreated case of pneumococcic meningitis, certain reactions may take place which are similar to those observed when such a serum is added to a test tube containing a heavily grown culture. These reactions would consist of agglutination of the organisms into large floccular clumps and the formation of a heavy precipitate from the interaction of the free soluble specific substance and its specific antibody. Such reactions may be harmful fully apart from their purely mechanical effect, since they would obviously enhance the possibilities of interfering with proper circulation and drainage of spinal fluid, and possibly enhance the inflammatory reaction in the meninges. *In vitro* phagocytic and pneumococidal tests on whole blood have shown that such agglutination and precipitation result quite regularly in the formation of large clumps of phagocytic leukocytes which become enmeshed in the clumps of agglutinated organisms, these cells become easily disrupted after they have engulfed numerous bacteria or they are prevented from acting on the bacteria. Free growth of organisms usually occurs under such conditions, whereas, if similar amounts of culture and much smaller amounts of serum are used, phagocytosis and killing of the pneumococci result. This has already been pointed out by Ward.² It may be further assumed that the precipitate may be toxic to the phagocytic cells as shown by Cromwell and Centeno,⁵ thus interfering further with their action even if complement and an optimum amount of the antibody were introduced.

One of our aims has been to avoid harmful reactions. We have learned from experiences with the intravenous use of concentrated antipneumococcic horse serums and from our recent experiences with therapeutic rabbit serums, that untoward reactions, entirely apart from what might be called reactions of sensitiveness, may follow the administration of these agents. Any type of reaction may prove harmful and even serious, particularly in the hands of inexperienced individuals. Furthermore, any given preparation may be ad-

ministered with impunity to a large number of patients and yet give untoward reactions of considerable severity in some isolated recipient. When such a reaction occurs after intravenous injections, particularly if one is prepared for such a contingency, it can usually be overcome by appropriate treatment. However, in certain old and debilitated individuals, and in some patients otherwise in good general condition who have had a severe infection and "toxemia" for several days, these reactions may be followed by a rapid decline and may possibly hasten a fatal outcome. Such general reactions, and perhaps even local reactions, may occur after intraspinal injection. These reactions, either by themselves or coupled with the interaction of the antibody with the components of the cerebrospinal fluid previously noted, may account for some of the sudden deaths or for the rapid declines that have been known to occur after intraspinal and especially after intraventricular injections of antipneumococcic serums. Since the reactions from intravenous injections cannot be predicted, in a given case, we have felt that the direct use of therapeutic antiserums intraspinally, at least in the amounts usually employed, should not be the method of choice and other methods should be tried.

Many cases of pneumococcic meningitis have or soon develop bacteremia. Except in cases with endocarditis, to which reference has already been made, it would seem essential for the proper control of the meningitis to prevent or control the bacteremia. This may be accomplished in many instances by the use of appropriate doses of sulfanilamide. According to our observations, the efficacy of this agent is quite uncertain when it is employed alone, and we have definitely failed to control heavy blood-stream invasions in many pneumonia patients by the use of large doses of the drug. However, we have found that specific serum given intravenously, particularly if used in conjunction with sulfanilamide therapy, has effectively controlled even massive blood-stream invasions. It seems reasonable, therefore, that this procedure should be an important adjunct to the treatment of pneumococcic meningitis. Obviously, if it can be shown that the patient already has a large excess of circulating antibodies against the infecting organism in his blood stream, as demonstrated by the presence of agglutinins, precipitins or mouse-protective antibodies, the intravenous injection of therapeutic antibody would be superfluous. The demonstration of naturally occurring opsonins, as shown by phagocytosis or by pneumococidal action of the whole blood, is not usually sufficient, since these have been demon-

strated early in the course of pneumococcic infections even in the presence of progressive bacteremia^{3, 6}

It seems reasonable to suppose that, following the use of sulfanilamide, which, as we have noted, results in decreasing the infection in the meninges at least temporarily, small amounts of specific antibody and complement may, in some individuals, reach the infected meninges and not be detectable by the ordinary tests because they are rapidly used up. In this event recovery might take place without further treatment. On the other hand, although our studies in this direction have not yet been completed, it would appear from the data now available that after antipneumococcic horse or rabbit serums are given intravenously, even in the presence of only small numbers of pneumococci, the antibody does not reach the cerebrospinal fluid in demonstrable amounts. It would seem necessary, in most instances, to introduce some antibody into the infected area provided that this could be done without undue risk of severe reactions. After much of the cerebrospinal fluid present before the beginning of sulfanilamide therapy has been drained off by lumbar punctures and the infection reduced by the use of the drug, very small amounts of specific antibody should be sufficient to complete the sterilization of the cerebrospinal fluid provided that there have not yet developed any well-localized areas of abscess formation.

The most readily available supply of antibody which is the least likely to give untoward reactions and at the same time provide complement and an optimum amount of antibody, is the patient's own fresh serum after a balance of specific antibody has been established in the circulating blood.

PROCEDURE ADOPTED

For these reasons we have resorted to the following general procedure:

- 1 Complete and frequent drainage of the spinal fluid

- 2 Immediate institution and continuous use of large doses of sulfanilamide by mouth or by subcutaneous injection, if necessary. The optimum dose has not been determined. Sodium bicarbonate is given with each dose.

- 3 Identification of the pneumococcus as rapidly as possible and the intravenous administration of sufficient specific antipneumococcic serum, to establish a balance of antibody in the circulating blood.

- 4 Moderate fluid intake by whatever route necessary, to insure adequate amounts of spinal fluid for drainage.

- 5 About two hours after a reasonable dose has

been given, blood is withdrawn from the patient and serum rapidly separated.

- 6 Following the removal of spinal fluid at the time of the next lumbar puncture, this serum is given intraspinally (5 to 10 cc should be sufficient, the optimum amount has not been determined but it is probably small). This procedure may be repeated after subsequent lumbar punctures, if necessary. In small children or in infants it may be necessary to use fresh human serum from another source for complement, and, in that event, only very small amounts of specific therapeutic serum need be added (0.5 cc or less should be sufficient).

- 7 Lumbar punctures are repeated until the fluid is normal. The frequency is determined by the initial pressure of the fluid and its cellular and protein contents.

- 8 Transfusions are given after the first week of sulfanilamide therapy if anemia develops, and are repeated, as necessary, until the drug is discontinued (after 7 to 14 days of sterile fluids).

These procedures serve to insure a balance of antibody in the blood stream and to control the bacteremia. They should, in most instances where the sulfanilamide effectively reduces the infection, provide an adequate amount of antibody and complement in the optimum proportions and in a medium which is likely to give the least local or general reaction and the greatest antibacterial effect. The cases to be presented will illustrate the application of some of the principles enumerated.

RÉSUMÉ OF THE CASE HISTORIES AND LABORATORY STUDIES

The salient features of the clinical courses will be summarized in the text and in the legends to the figures. The essential details of the therapy and of the laboratory findings are shown graphically in the figures. For the sake of brevity only pertinent data which are not shown in the figures will be mentioned in the text.

Case 1 A 19 year-old, white, Italian schoolboy was admitted to the hospital May 23, 1937, delirious and irrational. From his sister it was learned that he had complained of headache, general malaise and fever for 2 days. On the morning of admission his headache and malaise increased. He became markedly prostrated and then delirious, and was taken to the hospital.

He had had measles, whooping cough and diphtheria in early childhood, and pneumonia at the age of six. Two years prior to entry he sustained a head injury with loss of consciousness for several hours. Following this injury he complained frequently of severe headaches and dizzy spells.

Examination at the time of admission showed a normally developed adolescent, acutely ill but co-operative.

in spite of a muttering delirium. His skin was warm and moist. The throat was dry and injected. There was moderate rigidity of the neck and bilateral positive Kernig sign. The optic disks were well outlined, and the vessels appeared normal. Other reflexes were active and equal on both sides. Subsequent examination by an aural surgeon revealed no abnormalities of the ears, nose or paranasal sinuses. Lumbar puncture revealed cloudy fluid under a pressure of 410 mm of water. Smear of the fluid showed suggestive diplococci which appeared to be decolorized with the Gram stain. Culture, however, showed Type XI pneumococcus.

The patient was immediately given 5 gm of sulfanil

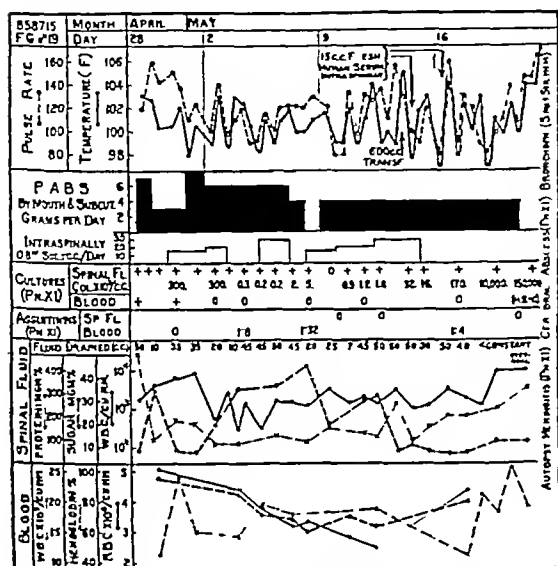


Figure 1* Case 1 Primary (?) Type XI pneumococcus meningitis with bacteremia. Intensive and sustained treatment with sulfanilamide by mouth, subcutaneously and intraspinally. Complete control of bacteremia and temporary improvement in clinical condition and in spinal-fluid findings. Failure completely to control the meningeal infection. Development of antibodies in the circulating blood and failure to demonstrate these antibodies in the spinal fluid. Increase in bacterial counts of spinal fluid after intraspinal injections of fresh human serum from a non-immune donor during the presence of circulating antibodies in the blood. Progressive anemia partly improved by transfusion. Death after four weeks. Autopsy: purulent meningitis and cerebral (frontal lobe) abscess—Pneumococcus Type XI hemorrhagic bronchopneumonia—hemolytic *Staphylococcus aureus* and alpha hemolytic streptococci (no pneumococci).

*ABBREVIATIONS AND SYMBOLS USED IN ALL FIGURES

- P.A.B.S. = sulfanilamide (para aminobenzenesulfonamide)
 CULTURES: PM = pneumococcus the type is indicated in Roman numerals
 SP FL = spinal fluid
 COL./cc = number of colonies per cubic centimeter in blood agar pour plates.
 — = growth in broth of the type of pneumococcus indicated
 AGGLUTININS: 0 = no agglutination with equal amount of formalized antigen and undiluted serum.
 1:2 etc. = highest dilution of serum showing floccular agglutination
 S. AU = *Staphylococcus aureus* (hemolytic)
 S. MC. = *Bacillus mucosus capsulatus*
 H. INF = *Hemophilus influenzae*
 H. B = heart's blood
 NEG. = vegetation
 IN-SP = intraspinally
 STR. HEM. = *Streptococcus hemolyticus*

amide by mouth and then daily amounts of this drug as indicated in the chart. These amounts were given in four divided doses at 6-hour intervals. Only one subcutaneous injection of 350 cc. of 0.8 per cent solution was given on May 1. On May 8 the drug was discontinued for the day because of increasing anemia. The total amount of the drug given was approximately 105 gm. by mouth, 3 gm subcutaneously, and 2.5 gm intrathecally. The fluid intake was maintained at 3000 to 4000 cc. daily, intravenous normal saline and 5 per cent glucose solutions being used when insufficient amounts were taken by mouth. On the second day in the hospital he seemed improved and became rational. On that day herpes labialis appeared, and his skin assumed a dusky cyanotic tinge. The carbon-dioxide combining power of his blood at this time was 35 vol per cent. Thereafter sodium bicarbonate was given with each dose of sulfanilamide in equal amounts. Intraspinally injections of 15 cc. of fresh human serum from a Group A donor (the patient's blood was Group A) were given on May 14 and 16. The fresh whole defibrinated blood of this donor showed phagocytosis and pneumococcal activity for the patient's organisms, but no agglutinins. These injections did not appreciably alter the findings in the spinal fluid. He remained rational most of the time until May 18 when he began to fail rapidly. His spinal fluid became more purulent, and the pressure, which had been below 190 mm. of water during the previous week, again rose above 400. Constant drainage through the lumbar region was established intermittently, but it became necessary to resort to cisternal punctures to obtain fluid for the relief of pressure. He developed, successively, headache, nausea, vomiting, delirium, stupor, coma and pulmonary edema and died on May 23.

Autopsy showed a cortical abscess of the frontal lobe in addition to the acute diffuse purulent meningitis, but no evidence of recent or old infection in the ears, mastoids or accessory nasal sinuses.

Case 2 A 47-year-old, white, obese housewife was admitted from the Out Patient Department on October 18, 1937, for surgery of the accessory nasal sinuses. In the past she had had the usual childhood infections, occasional sore throats, recurrent left otorrhea and, for 2 or 3 years, frequent asthmatic attacks. Both nares were filled with polyps, and all her nasal sinuses were cloudy. The lungs were clear. On October 23 she had a bilateral ethmoidectomy and bilateral radical antrum operation with complete removal of the markedly polypoid mucous membrane, but the bony walls were left intact. The middle turbinates and nasal polyps were removed from both sides of the nose.

On October 25 the patient developed fever and signs of meningitis, and lumbar puncture showed cloudy fluid under increased pressure and Type XAI pneumococci were cultured from the fluid. The following day she received 6 gm of sulfanilamide and, thereafter, 4 gm of the drug was given daily, divided into six doses. Lumbar punctures were done daily until November 7 when she was placed on continuous lumbar drainage. This had to be interrupted frequently because the needle became plugged with thick, fibrinous, purulent exudate. Beginning November 15 cerebrospinal fluid was removed by cisternal puncture. Except for occasional periods of vomiting and delirium she remained conscious and rational until November 18. On that day she became irrational, failed rapidly, became comatose and died the following day. There was no autopsy.

Case 3 A 43-year-old, white woman was admitted to the hospital on January 23, 1938, stuporous and groaning

strated early in the course of pneumococcic infections even in the presence of progressive bacteremia^{2, 6}

It seems reasonable to suppose that, following the use of sulfanilamide, which, as we have noted, results in decreasing the infection in the meninges at least temporarily, small amounts of specific antibody and complement may, in some individuals, reach the infected meninges and not be detectable by the ordinary tests because they are rapidly used up. In this event recovery might take place without further treatment. On the other hand, although our studies in this direction have not yet been completed, it would appear from the data now available that after antipneumococcic horse or rabbit serums are given intravenously, even in the presence of only small numbers of pneumococci, the antibody does not reach the cerebrospinal fluid in demonstrable amounts. It would seem necessary, in most instances, to introduce some antibody into the infected area provided that this could be done without undue risk of severe reactions. After much of the cerebrospinal fluid present before the beginning of sulfanilamide therapy has been drained off by lumbar punctures and the infection reduced by the use of the drug, very small amounts of specific antibody should be sufficient to complete the sterilization of the cerebrospinal fluid provided that there have not yet developed any well-localized areas of abscess formation.

The most readily available supply of antibody which is the least likely to give untoward reactions and at the same time provide complement and an optimum amount of antibody, is the patient's own fresh serum after a balance of specific antibody has been established in the circulating blood.

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For these reasons we have resorted to the following general procedure:

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3 Identification of the pneumococcus as rapidly as possible and the intravenous administration of sufficient specific antipneumococcic serum, to establish a balance of antibody in the circulating blood.

4 Moderate fluid intake by whatever route necessary, to insure adequate amounts of spinal fluid for drainage.

5 About two hours after a reasonable dose has

been given, blood is withdrawn from the patient and serum rapidly separated.

6 Following the removal of spinal fluid at the time of the next lumbar puncture, this serum is given intraspinaly (5 to 10 cc should be sufficient, the optimum amount has not been determined but it is probably small). This procedure may be repeated after subsequent lumbar punctures, if necessary. In small children or in infants it may be necessary to use fresh human serum from another source for complement, and, in that event, only very small amounts of specific therapeutic serum need be added (0.5 cc or less should be sufficient).

7 Lumbar punctures are repeated until the fluid is normal. The frequency is determined by the initial pressure of the fluid and its cellular and protein contents.

8 Transfusions are given after the first week of sulfanilamide therapy if anemia develops, and are repeated, as necessary, until the drug is discontinued (after 7 to 14 days of sterile fluids).

These procedures serve to insure a balance of antibody in the blood stream and to control the bacteremia. They should, in most instances where the sulfanilamide effectively reduces the infection, provide an adequate amount of antibody and complement in the optimum proportions and in a medium which is likely to give the least local or general reaction and the greatest antibacterial effect. The cases to be presented will illustrate the application of some of the principles enumerated.

RÉSUMÉ OF THE CASE HISTORIES AND LABORATORY STUDIES

The salient features of the clinical courses will be summarized in the text and in the legends to the figures. The essential details of the therapy and of the laboratory findings are shown graphically in the figures. For the sake of brevity only pertinent data which are not shown in the figures will be mentioned in the text.

Case 1 A 19 year-old, white, Italian schoolboy was admitted to the hospital May 23, 1937, delirious and irrational. From his sister it was learned that he had complained of headache, general malaise and fever for 2 days. On the morning of admission his headache and malaise increased. He became markedly prostrated and then delirious, and was taken to the hospital.

He had had measles, whooping cough and diphtheria in early childhood, and pneumonia at the age of six. Two years prior to entry he sustained a head injury with loss of consciousness for several hours. Following this injury he complained frequently of severe headaches and dizzy spells.

Examination at the time of admission showed a normally developed adolescent, acutely ill but co-operative.

in spite of a muttering delirium. His skin was warm and moist. The throat was dry and injected. There was moderate rigidity of the neck and bilateral positive Kernig sign. The optic disks were well outlined, and the vessels appeared normal. Other reflexes were active and equal on both sides. Subsequent examination by an aural surgeon revealed no abnormalities of the ears, nose or paranasal sinuses. Lumbar puncture revealed cloudy fluid under a pressure of 410 mm. of water. Smear of the fluid showed suggestive diplococci which appeared to be decolorized with the Gram stain. Culture, however, showed Type XI pneumococcus.

The patient was immediately given 5 gm. of sulfani-

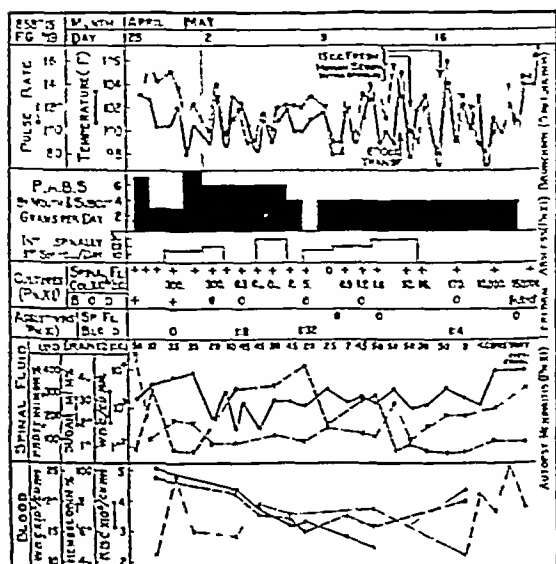


Figure 1 • Case 1 Primary (?) Type XI pneumococcus meningitis with bacteremia. Intensive and sustained treatment with sulfanilamide by mouth subcutaneously and intraspinally. Complete control of bacteremia and temporary improvement in clinical condition and in spinal fluid findings. Failure completely to control the meningeal infection. Development of antibodies in the circulating blood and failure to demonstrate these antibodies in the spinal fluid. Increase in bacterial counts of spinal fluid after intraspinal injections of fresh human serum from a non-immune donor during the presence of circulating antibodies in the blood. Progressive anemia partly improved by transfusion. Death after four weeks. Autopsy—purulent meningitis and cerebral (frontal lobe) abscess—Pneumococcus Type XI hemorrhagic bronchopneumonia—hemolytic *Staphylococcus aureus* and alpha hemolytic streptococci (no pneumococci).

*ABBREVIATIONS AND SYMBOLS USED IN ALL FIGURES.

- P.A.B.S. = sulfanilamide (para aminobenzenesulfonamide)
 CULTURES: PN = pneumococcus; the type is indicated in Roman numerals
 SF FL. = spinal fluid
 col./cc. = number of colonies per cubic centimeter in blood agar pour plates
 = growth, in both of the type of pneumococcus indicated.
 AGGLUTININS: 0 = no agglutination with equal amount of formalized antigen and undiluted serum.
 12 etc. = highest dilution of serum showing floccular agglutination
 S. AC. = *Staphylococcus aureus* (hemolytic)
 B.M.C. = *Bacillus mucosus capsulatus*
 H. IN. = *Haemophilus influenzae*
 H. S. = heart's blood
 VEG. = vegetation
 IN. SP. = intraspinally
 STR. HEM. = streptococcus hemolyticus

amide by mouth and then daily amounts of this drug as indicated in the chart. These amounts were given in four divided doses at 6-hour intervals. Only one subcutaneous injection of 350 cc. of 0.8 per cent solution was given on May 1. On May 8 the drug was discontinued for the day because of increasing anemia. The total amount of the drug given was approximately 105 gm. by mouth 3 gm. subcutaneously, and 2.5 gm. intrathecally. The fluid intake was maintained at 3000 to 4000 cc. daily intravenous normal saline and 5 per cent glucose solutions being used when insufficient amounts were taken by mouth. On the second day in the hospital he seemed improved and became rational. On that day herpes labialis appeared and his skin assumed a dusky cyanotic tinge. The carbon-dioxide combining power of his blood at this time was 35 vol. per cent. Thereafter sodium bicarbonate was given with each dose of sulfanilamide in equal amounts. Intraspinal injections of 15 cc. of fresh human serum from a Group A donor (the patient's blood was Group A) were given on May 14 and 16. The fresh whole defibrinated blood of this donor showed phagocytosis and pneumococidal activity for the patient's organisms, but no agglutinins. These injections did not appreciably alter the findings in the spinal fluid. He remained rational most of the time until May 18 when he began to fail rapidly. His spinal fluid became more purulent, and the pressure, which had been below 190 mm. of water during the previous week, again rose above 400. Constant drainage through the lumbar region was established intermittently, but it became necessary to resort to cisternal punctures to obtain fluid for the relief of pressure. He developed, successively, headache, nausea, vomiting, delirium, stupor, coma and pulmonary edema and died on May 23.

Autopsy showed a cortical abscess of the frontal lobe in addition to the acute diffuse purulent meningitis, but no evidence of recent or old infection in the ears, mastoids or accessory nasal sinuses.

Case 2 A 47-year-old, white, obese housewife was admitted from the Out Patient Department on October 18, 1937, for surgery of the accessory nasal sinuses. In the past she had had the usual childhood infections, occasional sore throats, recurrent left otorrhea and, for 2 or 3 years, frequent asthmatic attacks. Both nares were filled with polyps, and all her nasal sinuses were cloudy. The lungs were clear. On October 23 she had a bilateral ethmoidectomy and bilateral radical antrum operation with complete removal of the markedly polypoid mucous membrane, but the bony walls were left intact. The middle turbinates and nasal polyps were removed from both sides of the nose.

On October 25 the patient developed fever and signs of meningitis, and lumbar puncture showed cloudy fluid under increased pressure and Type XXI pneumococci were cultured from the fluid. The following day she received 6 gm. of sulfanilamide and, thereafter, 4 gm. of the drug was given daily, divided into six doses. Lumbar punctures were done daily until November 7 when she was placed on continuous lumbar drainage. This had to be interrupted frequently because the needle became plugged with thick, fibrinous, purulent exudate. Beginning November 15 cerebrospinal fluid was removed by cisternal puncture. Except for occasional periods of vomiting and delirium she remained conscious and rational until November 18. On that day she became irrational, failed rapidly, became comatose and died the following day. There was no autopsy.

Case 3 A 43-year-old, white woman was admitted to the hospital on January 23, 1938, stuporous and groaning

She responded to painful stimuli but not to questions or commands. It was later learned that she had been sick for 4 weeks with cough and right sided pleurisy.

She was emaciated and pale. The lips and fingertips were moderately cyanotic, and she was shaking as though she were having a chill. The pupils were dilated and reacted sluggishly to light, but the optic disks and retinæ appeared normal. The mucous membranes of the nose and throat were injected. The neck was moderately rigid. There were dullness, bronchial breathing and in

after the beginning of sulfanilamide treatment the patient became rational, but she soon began to fail rapidly in spite of intensive treatment and died on January 29. Autopsy showed the extensive purulent meningitis, or

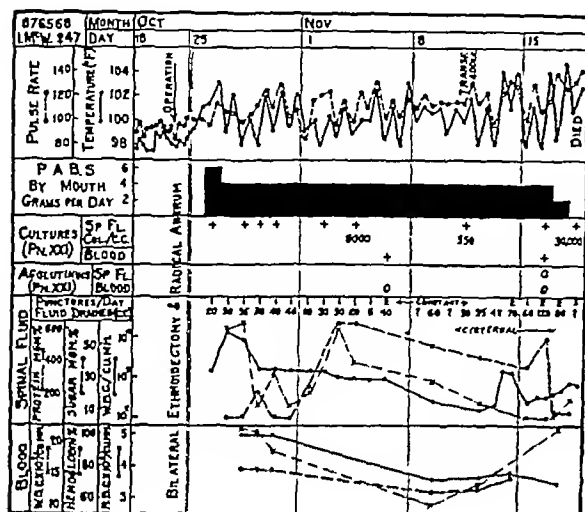


Figure 2 Case 2. *Pneumococcus* Type XXI meningitis with bacteremia beginning two days after extensive nasal sinus operation. Treatment with sulfanilamide in moderate dosage by mouth begun at first appearance of meningeal signs. Temporary improvement in clinical appearance and in spinal-fluid findings. Failure completely to control the meningeal infection or to prevent the occurrence of bacteremia. Failure to demonstrate specific antibodies (agglutinins) in blood or spinal fluid. Interference with drainage of spinal fluid due to thick exudate. Development of anemia. Progression of symptoms and signs of meningitis. Death on twenty-sixth day. No autopsy.

creased voice sounds over the region of the right upper lobe, but no rales were heard. The heart was slightly enlarged to the left, and a faint diastolic murmur was heard over most of the precordium. The deep reflexes were active and equal. Kernig and Babinski signs were positive on both sides. The blood pressure was 110/80, the red-blood count 3,310,000, the hemoglobin 46 per cent (Sahl), and white blood count 19,400. A roentgenogram of the chest showed an irregular mottled density of the right apex and upper lung field. Lumbar puncture done soon after admission yielded slightly cloudy fluid, the initial pressure being 220 mm. of water. Culture of this fluid showed Type VII pneumococci.

The patient required restraint, and all food and medication were given by nasal tube. Sulfanilamide in large doses was begun shortly after admission. Specific antipneumococcus serum was given intravenously in large divided doses beginning January 26. After the first course of injections the patient was given a single injection of 5 cc. of fresh normal serum intraspinally. Blood culture before the beginning of serum treatment revealed a massive bacteremia and later cultures showed that this was not materially affected by the therapy. For a short time

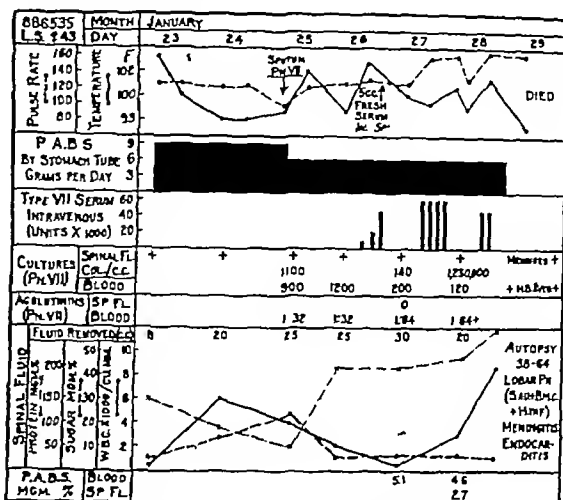


Figure 3 Case 3. *Pneumococcus* Type VII meningitis with bacteremia four weeks after onset of lobar pneumonia. Intensive treatment with sulfanilamide followed by large doses of concentrated specific antipneumococcus horse serum intravenously. Slight brief improvement in general condition. Failure to control the bacteremia or the meningeal infection. Coexistence of circulating antibodies and heavy bacteremia before serum therapy. Failure to demonstrate specific antibodies in the spinal fluid after intravenous therapy. Failure to influence meningeal infection with single small dose of fresh human serum from a non-immune donor. Death on seventh hospital day. Autopsy: lobar pneumonia, right upper lobe (*Staphylococcus aureus*, *Bacillus mucosus capsulatus* (atypical) and *Hemophilus influenzae*—no pneumococci), obliterative pleuritis—right lung, purulent meningitis (Type VII pneumococcus), vegetative endocarditis of mitral valve (Type VII pneumococcus).

ganizing lobar pneumonia of the right upper lobe, healed pleuritis of the entire right lung, vegetative endocarditis involving the auricular surface of the posterior mitral cusp.

Case 4 A 19-year-old Jewish girl was admitted to the hospital October 30, 1937. She complained of frontal and occipital headaches for 2 months, increasing in severity and occasionally associated with projectile vomiting. For 4 weeks she had been confined to bed with this and with continuous pain in the right upper abdomen and right-lower chest. She had vertigo and dizziness for 2 weeks, and transient blindness followed by diplopia on the day before entry. For 6 months she had had irregular and painful menstruation.

In the past she had had the common childhood infections, occasional sore throats, otitis media many years back, frequent headaches for 2 years, in 1933 an attack of jaundice lasting a month, and excision of an axillary node following an infection of a fingernail. One year before entry she fell on her right temple and lost consciousness for a short while.

Examination showed a fairly well-developed and nourished girl of somewhat inferior mentality, tossing about restlessly, groaning and expressing pain on motion of the

head. There was tenderness over the scalp and abdomen, early choked disks with hemorrhagic retinal exudate and visual disturbances, absent abdominal reflexes, hyperactive deep reflexes, bilateral ankle clonus, general muscular weakness, and past pointing on the finger to nose test. The left eardrum showed thickening with loss of light reflex. Roentgenogram of the skull showed convolitional atrophy indicating increased intracranial pressure. The latter was

arv 31 and then less frequently, a total of one hundred and twenty five punctures being done in all. She developed infection in the tract of the punctures done at the fourth lumbar space and culture from this tract done on January 7 showed Type XVII pneumococci. There were no signs of meningitis at this time and the spinal fluid had become clear. Sulfanilamide therapy was continued until February 8. Improvement in her general condition began on January 8, and except for slight ataxia and lumbar pain on walking, she was symptom free.

Case 5 An 8-year-old white schoolgirl was struck by an automobile at 8 p. m. on February 16, 1938. Except for momentary loss of consciousness at the time of arrival to the hospital she remained alert and rational. There

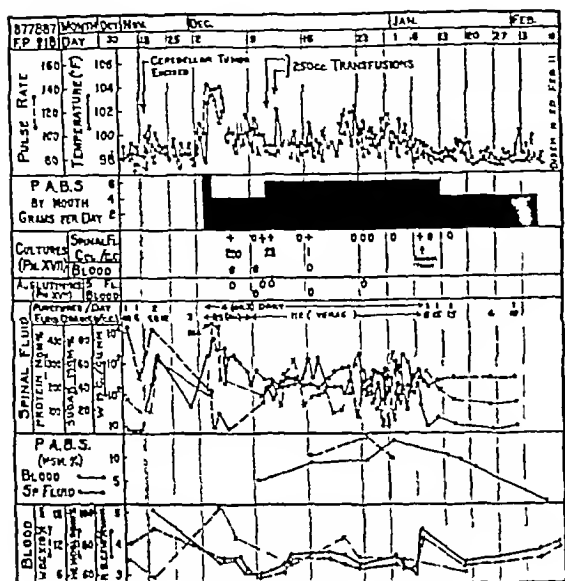


Figure 4 Case 4 *Pneumococcus* Type XVII meningitis occurring two weeks after extensive cerebellar exploration and incomplete removal of large vascular medulloblastoma. Intensive sulfanilamide therapy by mouth begun with first appearance of fever and meningeal symptoms and maintained. Positive spinal fluid cultures intermittently for two weeks and from abscess in lumbar tract two weeks later. Failure to demonstrate antibodies in blood or spinal fluid. Development of moderate anemia. Gradual recovery with return of spinal fluid findings to within normal limits. Residual ataxia and lumbar pain.

confirmed by lumbar puncture. A diagnosis of posterior fossa tumor was made.

On November 18, bilateral trephine of the skull and ventricular taps were done and fluid in both ventricles found to be under increased pressure. A cerebellar exploration was then done and the largest part of an extensive vascular medulloblastoma was removed piecemeal. The operation was well tolerated, but following it there was considerable vomiting and the patient was given fluids intravenously for several days. On December 2 she complained of pain in the left ear which was apparently due to a furuncle in the external auditory meatus. On the morning of December 3 the patient's temperature rose, and she became drowsy, restless and irrational. She complained of occipital pain and developed signs of meningitis. Lumbar puncture showed cloudy fluid under a pressure of 310 mm. of water. She was immediately started on large doses of sulfanilamide, given by nasal tube at first and later by mouth. Cultures of the fluid showed Type XVII pneumococcus in small numbers intermittently to December 16 and remained sterile thereafter. Lumbar punctures were done three or four times daily until Janu-

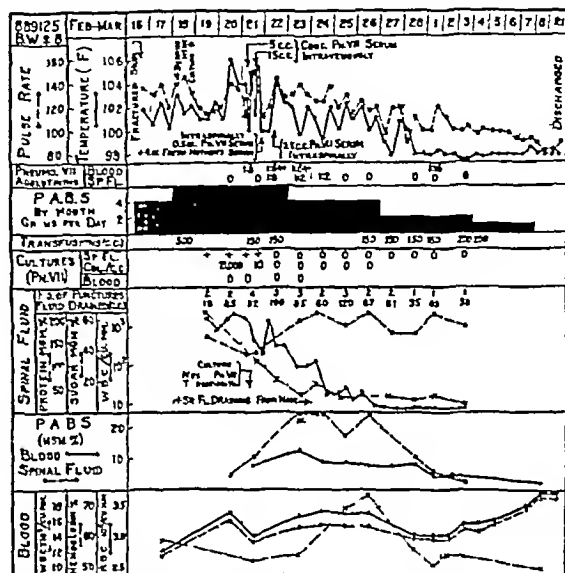


Figure 5 Case 5 *Pneumococcus* Type VII meningitis beginning three days after compound fracture of skull through right frontal and temporal bones and criciform plate and one day after extensive debridement. Drainage of spinal fluid through nose. Failure of moderate doses of sulfanilamide given prophylactically to prevent occurrence of meningitis. Administration of concentrated specific antipneumococcal horse serum intravenously and failure, thereafter, to demonstrate specific antibody in the spinal fluid. Maintenance of sulfanilamide therapy and attainment of higher concentration in spinal fluid than in blood after injection of concentrated antipneumococcal horse serum intraspinally. Rapid and permanent control of meningeal infection after single intraspinally injection of small amount of specific antipneumococcal horse serum together with fresh human serum from a non-immune donor, and temporary establishment of a balance of antibody in the spinal fluid. Development of anemia controlled by repeated transfusions. Complete and rapid recovery from meningitis with subsequent healing of operative wound.

was an extensive laceration and evulsion of the scalp with bruises and abrasions of the skin. From the nose there was a profuse bloody discharge which seemed to be mixed with spinal fluid. The eyelids were markedly edematous, completely closing the right eye and partly closing the left. Movement of the spine during and after an unsuccessful attempt at lumbar puncture was painful. There

was no voluntary motion of the neck, but no rigidity. A roentgenogram showed an extensive linear fracture in the frontal region extending just beyond the midline on the left and through the right frontal and temporal bones, with separation of the fragments.

Immediately after admission the patient was started on sulfanilamide 1 gm. every six hours by mouth in an effort to prevent or abort infection of the meninges. The dose was increased 2 days later to 1 gm. every 4 hours.

On February 18, an extensive debridement was carried out under Avertin and ether anesthesia. The operation involved removing a considerable amount of bone just above the bridge of the nose, opening the posterior wall of the frontal sinus and tearing out a piece of dura 1 cm. long, which was impinged in the fracture line that had widened out somewhat as it passed through the cribriform plate. The mucous membrane of the wall of the frontal sinus appeared to be intact. A drain was packed loosely between the torn dura and the fracture line and allowed to protrude from the superior angle of the wound at the bridge of the nose. Another drain was inserted under the right posterior flap of the avulsion and allowed to protrude from the inferior portion of the wound, and the laceration was closed as well as possible. A culture of fluid aspirated from the wound at the operation showed no growth. Following the operation there was considerable seepage of spinal fluid through the frontal drain.

On the day following the operation the patient complained of a "bursting headache," became very restless, and vomited. Fluids were given intravenously. The first successful lumbar puncture was done at 9 p. m. that evening. Cultures of this spinal fluid and of all others obtained during the following 2 days showed Type VII pneumococci. At 3 p. m. on February 21 the patient was given 5 cc. (25,000 units) of concentrated Type VII anti-pneumococcal serum, and 4 hours later 15 cc. (75,000 units) intravenously. At midnight she received intraspinally 0.5 cc. of the same therapeutic serum mixed with 4 cc. of her mother's freshly prepared serum. At the time of the next puncture, the following morning, another 0.5 cc. of the therapeutic serum was given intraspinally. Culture of the spinal fluid obtained before the first intraspinal injection showed Type VII pneumococci, but the fluid obtained the following morning and all subsequent fluids remained sterile. The spinal fluid findings soon became normal. There was a slight transient urticaria on February 23, and weakness of the left arm for a few days. There was no further evidence of meningeal infection, however, and the wound began to granulate in slowly.

Case 6 A 17-year-old white boy was involved in an automobile collision at 9 p. m. on March 9, 1938. He was treated for lacerations over the parietal region but returned later because of severe headaches and was admitted to the hospital on the following morning.

The patient had been followed in the Out Patient Department and 2 years previously had been admitted to the hospital because of epileptic seizures. He was said to have been dropped on his head at the age of 10 months. He had had mumps, measles and whooping cough, and had occasional headaches. In 1931 he was run over by an automobile and sustained a compound fracture of the right leg. In 1934 he had had a severe epistaxis following an injury.

At the time of admission there was a hematoma of the right eyelids, an abrasion over the bridge of the nose, and a laceration over the right parietal region. The reflexes were hyperactive on both sides. A lumbar puncture done at this time showed clear fluid and no increased pressure. During the next 2 days, however, the spinal

fluids were cloudy and under increased pressure, and cultures of these fluids showed Type XXVIII pneumococci. On March 12 it was first noticed that the patient had become totally deaf, and he remained so throughout his stay in the hospital.

Treatment with sulfanilamide, 1 gm. every 4 hours, was begun on the morning after admission. This dosage was increased at irregular intervals thereafter. Repeated lumbar punctures were done as indicated by the pressure and spinal fluid findings. Cultures of the spinal fluids remained positive, with some exceptions, until March 25. By March 21 the patient's general condition appeared to be getting worse. Following the first lumbar puncture

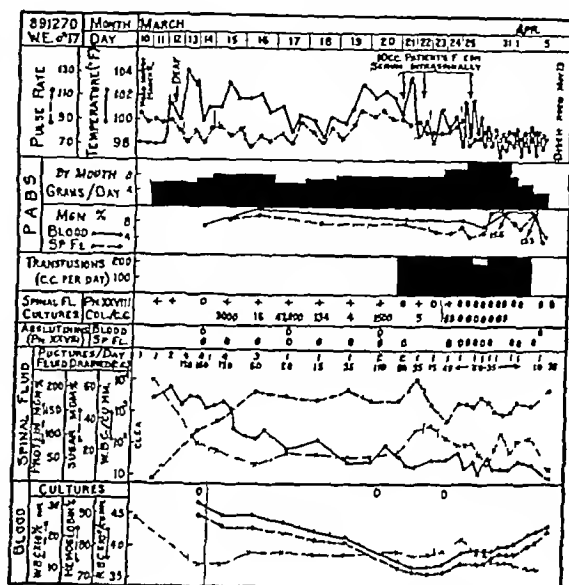


Figure 6 Case 6 *Pneumococcus* Type XXVIII meningitis following head injury with bleeding from both ears. Development of complete deafness the first day after onset of meningitis. Intensive sulfanilamide therapy by mouth beginning with the first evidence of infection. Stormy course with intermittent positive spinal fluid cultures for two weeks. Failure to demonstrate specific agglutinins in the blood or spinal fluid (phagocytic and pneumococcal activity demonstrated in the patient's whole defibrinated blood). Persistence of positive spinal fluid cultures after two intraspinal injections of patient's own fresh serum and control of the infection after the third injection. Development of progressive anemia with partial relief after daily transfusions for two weeks. Recovery from meningitis with persistence of deafness.

on that day, and again after the punctures done on March 22 and 25, he was given 10 cc. of his own serum, freshly prepared, intraspinally. This serum showed no agglutinins, but the whole defibrinated blood showed marked phagocytosis and pneumococcal activity for a culture of the organisms grown from the patient's own spinal fluid. Because of the progressive development of anemia he was given daily transfusions of 250 or 200 cc. of whole citrated blood for 2 weeks, with some improvement in the blood picture. The sulfanilamide was discontinued on April 5. The patient was observed in the hospital until May 13 and showed progressive improvement during that time. His nutritional state, which had declined progressively, began to improve rapidly after the first week in April.

Case 7 A 10-year-old white schoolboy was admitted to the hospital on April 9, 1938, complaining of frontal headache and fever of 3 days duration. On the day of admission he began to vomit and developed a stiff neck. One year previously he had acute otitis media, and since that time he had purulent discharge off and on from the left ear. There was some dried purulent exudate in the left external canal, the drum was retracted except in the inferior portion which was red and contained a postero-marginal perforation. There was no mastoid tenderness. Culture of the exudate from the left ear showed Type III pneumococci. There was some hyperemia of the nasal mucous membranes. The neck was rigid, and the Kernig and Brudzinski signs positive on both sides. Roentgenograms showed the mastoid tips to be clear. Lumbar punctures done on admission and again the following day showed slightly cloudy fluid under pressure of 300 and 370 mm. of water, respectively, but cultures of these fluids showed no growth and smears of the sediment showed no organisms.

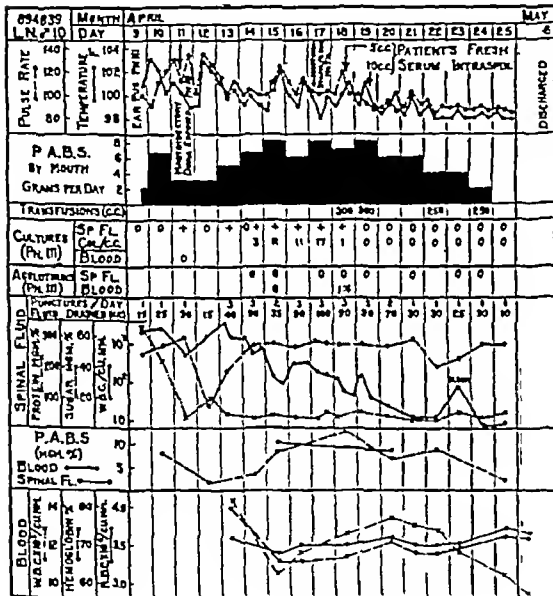


Figure 7 Case 7 *Pneumococcus Type III meningitis complicating chronic otitis media and mastoiditis. Mastoidectomy with exposure of dura. Intensive sulfanilamide therapy by mouth with failure completely to relieve the meningeal infection in ten days. Demonstration of specific antibodies in the circulating blood during active meningeal infection and failure to demonstrate antibodies in the spinal fluid at the same time. Complete and permanent control of meningeal infection after first intraspinal injection of patient's own fresh serum. Recovery.*

Sulfanilamide was given by mouth beginning the morning after admission. On May 11 a radical mastoidectomy was done. Purulent mucus was found on entering the antrum and culture of this exudate showed Type III pneumococci. The dura and lateral sinus were exposed and found to be normal. Necrotic tissue was curetted from around the lateral semicircular canal and the lateral sinus. Signs of meningitis persisted, and except for two spinal fluids obtained during the first 3 days after the operation, repeated lumbar punctures until April 18 yielded fluid from which Type III pneumococci were cul-

tured. The blood serum of the patient on March 15 failed to show agglutinins for Type III pneumococci, but they were demonstrated in the serum of April 18. On the latter date the culture of the spinal fluid was still positive for Type III pneumococci, and after this fluid was withdrawn 5 cc. of the patient's own freshly prepared serum was injected intraspinally. All subsequent lumbar punctures yielded fluids which showed no growth on culture. A second intraspinal injection of the patient's fresh serum was given on April 19. Thereafter, the patient made an uneventful recovery. Mouse protection tests carried out later showed that the serums of April 15 and 18, in 0.2 cc. amounts, protected mice against 1000 and 10,000 fatal doses of Type III pneumococci, respectively. The spinal fluids of the same dates showed no protection.

Case 8 A 7-year-old white boy was struck on the head and face by a falling plank on April 12, 1938. He lost consciousness for a brief period and, shortly thereafter, was brought to the hospital. The patient was a third child and was delivered with forceps without difficulty. He had had the usual childhood diseases and occasional tonsillitis.

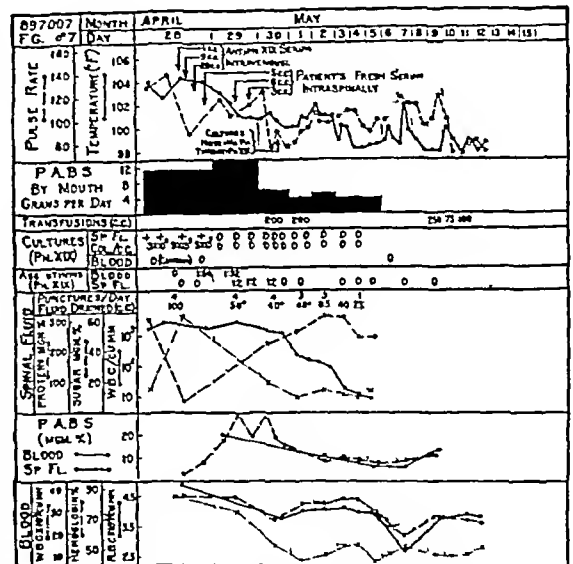


Figure 8 Case 8 *Pneumococcus Type XIV meningitis occurring 16 days after fracture of skull above right orbit and a few hours after a blow over the dorsal spine. Heavy infection of spinal fluid. Intensive sulfanilamide therapy by mouth followed by intravenous injection of specific antipneumococcal rabbit serum. Establishment of balance of homologous specific antibodies in the circulating blood and failure to demonstrate such antibodies in the spinal fluid after the intravenous injections. Rapid and complete control of meningeal infection after the first intraspinal injection of the patient's own fresh serum containing homologous antibody and establishment of a temporary balance of specific antibody in the spinal fluid. Development of anemia with improvement after repeated transfusions. Rapid and complete recovery.*

One year previously he had had a left otitis media. On examination, blood was seen oozing from the nose, and there was an area of ecchymosis over the right eye, but the child was conscious and rational. The tendon reflexes were hyperactive, there was a positive Kernig sign on

was no voluntary motion of the neck, but no rigidity. A roentgenogram showed an extensive linear fracture in the frontal region extending just beyond the midline on the left and through the right frontal and temporal bones, with separation of the fragments.

Immediately after admission the patient was started on sulfanilamide 1 gm. every six hours by mouth in an effort to prevent or abort infection of the meninges. The dose was increased 2 days later to 1 gm. every 4 hours.

On February 18, an extensive debridement was carried out under Avertin and ether anesthesia. The operation involved removing a considerable amount of bone just above the bridge of the nose, opening the posterior wall of the frontal sinus and tearing out a piece of dura 1 cm. long, which was impinged in the fracture line that had widened out somewhat as it passed through the cribriform plate. The mucous membrane of the wall of the frontal sinus appeared to be intact. A drain was packed loosely between the torn dura and the fracture line and allowed to protrude from the superior angle of the wound at the bridge of the nose. Another drain was inserted under the right posterior flap of the avulsion and allowed to protrude from the inferior portion of the wound, and the laceration was closed as well as possible. A culture of fluid aspirated from the wound at the operation showed no growth. Following the operation there was considerable seepage of spinal fluid through the frontal drain.

On the day following the operation the patient complained of a 'bursting' headache, became very restless, and vomited. Fluids were given intravenously. The first successful lumbar puncture was done at 9 p. m. that evening. Cultures of this spinal fluid and of all others obtained during the following 2 days showed Type VII pneumococci. At 3 p. m. on February 21 the patient was given 5 cc. (25,000 units) of concentrated Type VII anti-pneumococcal serum, and 4 hours later 15 cc. (75,000 units) intravenously. At midnight she received intraspinally 0.5 cc. of the same therapeutic serum mixed with 4 cc. of her mother's freshly prepared serum. At the time of the next puncture, the following morning, another 0.5 cc. of the therapeutic serum was given intraspinally. Culture of the spinal fluid obtained before the first intraspinal injection showed Type VII pneumococci, but the fluid obtained the following morning and all subsequent fluids remained sterile. The spinal fluid findings soon became normal. There was a slight transient urticaria on February 23, and weakness of the left arm for a few days. There was no further evidence of meningeal infection, however, and the wound began to granulate in slowly.

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At the time of admission there was a hematoma of the right eyelids, an abrasion over the bridge of the nose, and a laceration over the right parietal region. The reflexes were hyperactive on both sides. A lumbar puncture done at this time showed clear fluid and no increased pressure. During the next 2 days, however, the spinal

fluids were cloudy and under increased pressure, and cultures of these fluids showed Type XXVIII pneumococci. On March 12 it was first noticed that the patient had become totally deaf, and he remained so throughout his stay in the hospital.

Treatment with sulfanilamide, 1 gm. every 4 hours, was begun on the morning after admission. This dosage was increased at irregular intervals thereafter. Repeated lumbar punctures were done as indicated by the pressure and spinal fluid findings. Cultures of the spinal fluids remained positive, with some exceptions, until March 25. By March 21 the patient's general condition appeared to be getting worse. Following the first lumbar puncture

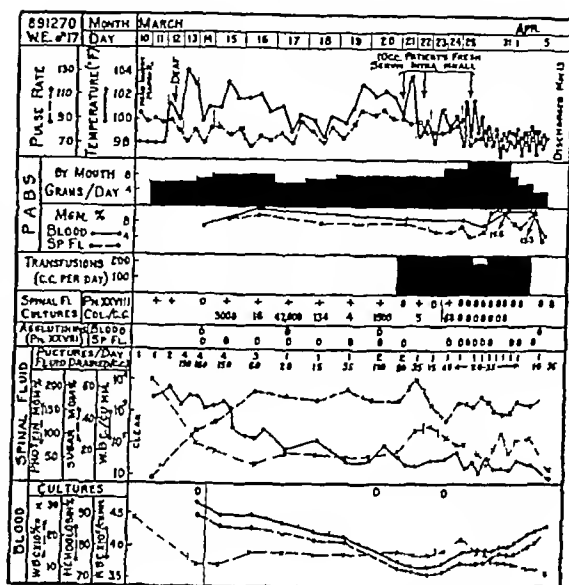


Figure 6 Case 6 *Pneumococcus* Type XXVIII meningitis following head injury with bleeding from both ears. Development of complete deafness the first day after onset of meningitis. Intensive sulfanilamide therapy by mouth beginning with the first evidence of infection. Stormy course with intermittent positive spinal fluid cultures for two weeks. Failure to demonstrate specific agglutinins in the blood or spinal fluid (phagocytic and pneumococcal activity demonstrated in the patient's whole defibrinated blood). Persistence of positive spinal-fluid cultures after two intraspinal injections of patient's own fresh serum and control of the infection after the third injection. Development of progressive anemia with partial relief after daily transfusions for two weeks. Recovery from meningitis with persistence of deafness.

on that day, and again after the punctures done on March 22 and 25, he was given 10 cc. of his own serum, freshly prepared, intraspinally. This serum showed no agglutinins, but the whole defibrinated blood showed marked phagocytosis and pneumococcal activity for a culture of the organisms grown from the patient's own spinal fluid. Because of the progressive development of anemia he was given daily transfusions of 250 or 200 cc. of whole citrated blood for 2 weeks, with some improvement in the blood picture. The sulfanilamide was discontinued on April 5. The patient was observed in the hospital until May 13 and showed progressive improvement during that time. His nutritional state, which had declined progressively, began to improve rapidly after the first week in April.

were generally diminished. Lumbar puncture yielded purulent fluid under increased pressure, with numerous organisms that were rapidly identified by direct smear, microscopic agglutination and Neufeld's capsular swelling reactions as Type IV pneumococci. Blood culture taken at this time also showed Type IV pneumococci, and these organisms were also obtained from cultures of the nose and throat and of the purulent discharge from the left ear. The patient was immediately given 2 gm. of sulfanilamide by stomach tube and 1 gm. every 4 hours thereafter. Intravenous administration of repeated small doses of anti pneumococcus Type IV rabbit serum was begun at 2 p.m.

During the succeeding hour the pulse became irregular and thready. Stimulants were given but the child failed to respond.

Autopsy done 15 hours after death showed the brain to be edematous and injected. Over the convexities there was a perivascular, greenish yellow exudate. There was similar purulent material at the base of the brain, especially around the optic chiasm and infundibulum. No abscesses were made out in sections of the brain. Both middle ears were full of green pus. The spinal cord was hyperemic with thickening of the leptomeninges. The lumbar space was completely filled with thick, fibrino-

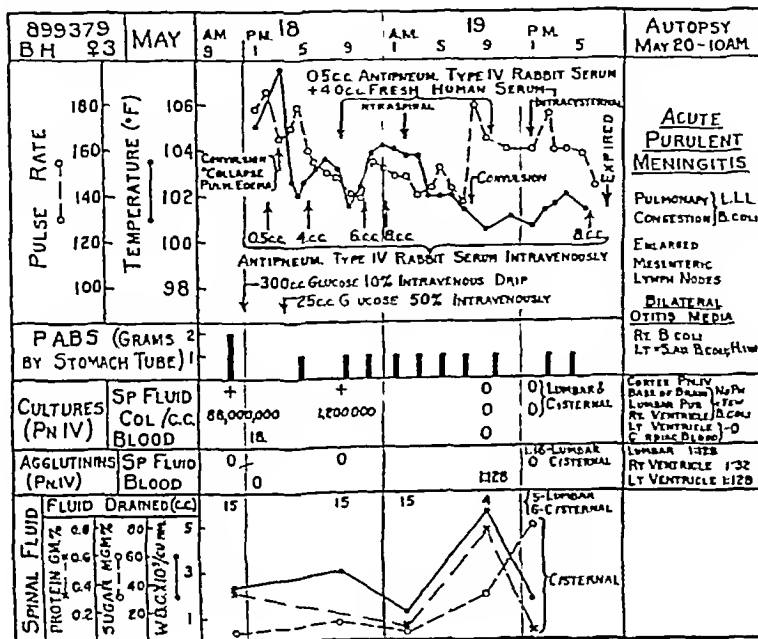


Figure 10 Case 10 *Pneumococcus* Type IV meningitis with bacteremia complicating otitis media. Treatment with sulfanilamide by mouth, intravenous specific antipneumococcal rabbit serum and similar serum mixed with fresh non-immune human sera intraspinally. Untoward reactions following intravenous injections. Block due to thick exudate and edema. Failure to grow pneumococci from lumbar and cisternal fluid after treatment. Death after thirty-two hours. Autopsy: bilateral acute otitis media, acute purulent meningitis, mild pulmonary congestion. Type IV pneumococci were cultured from the cortex of the brain but no organisms were grown from cultures of the lumbar, cisternal and ventricular fluids.

At this time the temperature was 105.4°F, and the pulse 178 and feeble. One hour after the first injection of 0.5 cc. the temperature rose to 107.4°F (rectally), and the pulse to 184, and the child had a convulsion followed by pulmonary edema and peripheral circulatory collapse. She improved after treatment with caffeine, intravenous 30 per cent glucose and oxygen inhalation. Subsequent doses were followed by slight motor activity without rise in temperature or pulse rate. Following each of the next three lumbar punctures she was given 0.5 cc. of the specific therapeutic rabbit serum and 4.5 cc. of fresh non-immune human serum intraspinally. At noon the following day a lumbar puncture was unsuccessful. A cisternal puncture was done, and a similar mixture of Type IV rabbit and fresh human serum was injected after removal of fluid. The last intravenous injection was given at 6:30 p.m. on May 19 at a time when the child was obviously mori-

purulent exudate. There was slight pulmonary congestion, and a few enlarged mesenteric nodes were noted in the abdomen. Cultures of fluid removed under aseptic precautions by lumbar and cisternal puncture and by puncture of each ventricle showed no growth except in the broth culture of the lumbar fluid, which contained colon bacilli. A culture taken from the cortex of the brain, however, showed a pure culture of Type IV pneumococci. A culture from the purulent exudate at the base of the brain showed a few colon bacilli but no pneumococci.

SUMMARY AND CONCLUSIONS

A method of treatment for meningitis due to specific types of pneumococci is described and the results of the bacteriological and immunological studies upon which it is based are reviewed.

both sides, and the Babinski sign was positive on the left. Roentgenograms of the skull showed a medial fracture above the right orbit. A lumbar puncture done on admission yielded pink fluid under normal pressure, and spinal fluid obtained on April 14 was clear. The patient's temperature and pulse rate were slightly elevated for the first 36 hours in the hospital but thereafter were normal. He rapidly became and remained free of symptoms and was discharged home on April 25.

Two days after discharge, while at play, he was kicked in the small of his back by one of his mates. Almost immediately thereafter he complained of headache and pain in the back and began to vomit all food. He was put to bed but became feverish and his symptoms increased progressively. He was readmitted to the hospital at 2 a. m. on April 28, at which time he showed typical signs of meningitis. A lumbar puncture showed purulent fluid under increased pressure. Culture of this and of subsequent fluids showed Type XIX pneumococci. Sulfanilamide therapy was instituted immediately after admission. Lumbar puncture at 2 p. m. yielded fluid which, in appropriate dilutions in blood agar-plate cultures showed approximately 900,000 colonies per cubic centimeter. At 4 30, 6 30 and 8 30 p. m. the patient was given 1, 9 and 20 cc., respectively, of homologous antipneumococcal rabbit serum intravenously. At 8 p. m. blood was withdrawn from the patient, and serum freshly prepared from it. At 9 p. m. another lumbar puncture was done, and culture of the fluid obtained showed 5000 colonies per cubic centimeter. After this fluid was withdrawn 5 cc. of the patient's freshly prepared serum was given intraspinally. On the following day two more intraspinal injections of 6 and 3 cc., respectively, of serum prepared from the blood of the patient obtained in the morning were given. Beginning with the fluid obtained at 2 a. m. on April 19, cultures of all spinal fluids showed no growth. The patient showed no further signs of meningeal infection and improved progressively. Each of the samples of the patient's serum that were given intraspinally showed a good titer of agglutinins for Type XIX pneumococci. The patient developed a slight progressive anemia which was controlled by transfusions while the sulfanilamide therapy was maintained.

Case 9 A 13-year-old schoolboy was admitted to the hospital at 4 a. m. on May 15, 1938. A week prior to entry he had a common cold with herpes. On the evening of May 10 he got wet and had chills. He soon developed headache, malaise and stiff neck. These symptoms continued until the day of entry when he became drowsy and prostrated. There was no history indicating any recent injury or aural or sinus infection. At the age of 6 he had had a splenectomy because of persistent splenomegaly and leukocytosis since early childhood. At the time of admission the patient was toxic and disoriented, his neck was rigid, there was marked muscular weakness of the extremities, and bilaterally positive Kernig and Brudzinski signs. Lumbar puncture yielded purulent fluid under a pressure of 300 mm. of water. Culture of this fluid showed Type XXVIII pneumococci, about 20,000,000 per cubic centimeter.

Sulfanilamide therapy by mouth was begun forthwith. On May 17 he became and remained rational and alert. On that day he received 40 cc. of homologous antipneumococcal rabbit serum intravenously between 4 and 7 30 p. m. At 9 p. m. some of the patient's blood was withdrawn and serum drawn off. One cubic centimeter of therapeutic rabbit serum was added to 5 cc. of the patient's freshly prepared serum, and the mixture given intraspinally after the next lumbar puncture, which was done at 11 p. m. Cultures of all subsequent spinal fluids

showed no growth. Five more similar injections were given during the next 2 days. The initial pressure at the time of the various lumbar punctures from the day after admission until the one done at 10 a. m. on May 20 was between 340 and 500 mm. of water. Thereafter the pressure gradually returned to normal. The patient began to improve progressively after the first intraspinal injection.

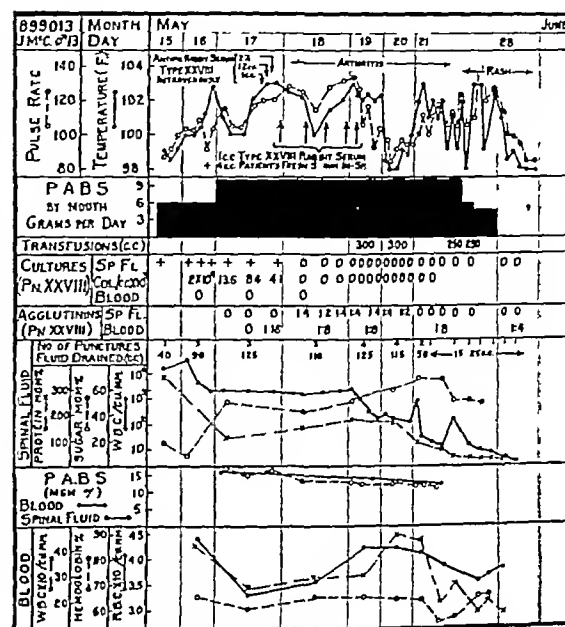


Figure 9 Case 9 Primary (?) Type XXVIII pneumococcus meningitis in a patient with persistent leukocytosis seven years after splenectomy. Intensive treatment with sulfanilamide by mouth with improvement in general condition and in spinal-fluid findings. Injection of specific antipneumococcal rabbit serum intravenously. Rapid establishment of a balance of specific antibodies in the circulating blood and failure to demonstrate them in the spinal fluid after the intravenous injections. Intraspinal injection of patient's fresh serum mixed with small amounts of specific antipneumococcal rabbit serum. Rapid and complete clearing of meningeal infection and recovery.

His meningeal symptoms cleared and spinal fluid findings returned to normal. On May 18 his left wrist was noted to be swollen and tender. This swelling receded somewhat on the next day. On May 21 there was slight tenderness and swelling of the left elbow and over the left biceps muscle. These symptoms rapidly cleared. He developed urticaria on May 26.

Case 10 A 3-year-old white girl was admitted to the hospital on May 18, 1938. On May 11 the patient developed otitis media with a foul smelling, purulent discharge from the left ear. She improved during the next 2 days. On May 16 she became drowsy, refused food, had fever and malaise, and vomited several times. On the following day she became semicomatose, and her mother observed that her neck was stiff. Her condition became steadily worse. At the time of admission the child was comatose, with rapid respirations and stiff neck. Her eyes were rolled outward and showed slight lateral nystagmus. The left eardrum was white and bulging, and the right was slightly injected. The tonsils showed scarring and exudate. The chest was clear. There were positive Kernig and Brudzinski signs bilaterally. The deep tendon reflexes

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That there is need for improvement in the mortality rates in gall-bladder surgery is evident since it has remained consistently high in spite of efforts to lower it. It seems apparent that several factors have contributed to maintain a high rate. The use of various diagnostic x-ray procedures has widened the accepted indications for operation. Also the improvement in surgical technic has made surgical treatment appear simpler and less tedious than medical. The result has been an increasing frequency of the employment of surgery which has engendered a feeling of increasing safety. This in turn has given rise to a complacency which has failed to subject mortality rates to sufficient consideration. Recently, surgeons have begun to realize that the operative treatment of cholecystitis has not been so satisfactory as they had hoped. A consideration of the failure to relieve some patients of their symptoms has also revived interest in the consideration of the morbidity and mortality rates. Several studies reviewing the results in living post-operative cases have appeared in the recent literature, but no study of the mortality rates covering such a large group as that here presented has been published. Particular emphasis in this study is placed on the effect of combining appendectomy with gall-bladder procedures.

group is analyzed according to the operative procedures employed, and the sex and age of the patient. The cases with lithiasis are further considered under three pathological categories: acute, subacute and chronic.

The acute, chronic and subacute groups do not represent the chronicity of symptoms, but rather the histological degree of inflammation. Often, in fact usually, the acute condition is found in a gall bladder which has been the seat of a protracted chronic condition with lithiasis, no acute cases occurred in this series in stoneless gall bladders. The etiology and pathology will not be discussed further in this paper.

The fatal cases are reviewed to determine the preoperative preparation, the means of diagnosis and the primary cause of death. No attempt has been made to study the cases from the standpoint of the technical methods employed. The series represents the work of several operators.

The total number of cases are also considered from the standpoint of the operation employed in relation to other diseases present (Table 2). It is astonishing to see the great variety of procedures that have been combined in gall-bladder surgery. The herniorrhaphies are not qualified in the list, but they represent ventral, incisional and inguinal operations. Nor has the operative procedure known as lysis of adhesions been listed, as practically every case of cholecystitis here covered showed either inflammatory or congenital adhesions around the gall bladder or duodenum. All the listed operations were performed at the same time.

The incidence of combined appendectomy and cholecystectomy in this series is 45.9 per cent. Unquestionably only the better-risk patients were subjected to both operations. The increased rate for the cases without appendectomy represents the general run of risks, whereas the cases with appendectomy represent a preferred-risk group.

An appendectomy was performed in 49.8 per cent of the stoneless cases, and in 43 per cent of the stone cases. The mortality rates again show lower figures in the appendectomy group. Appendectomy was performed only on those patients who were standing the operation well. With a generous right upper rectus or oblique incision, the appendix is usually brought into view easily and without any shock from undue handling of the viscera. In cases where there were pericecal adhesions and the symptoms or x-ray findings demanded an ap-

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Our series consists of 1018 cases of cholecystitis treated by surgery on the services of the Massachusetts Memorial Hospitals from 1924 through 1933 (Table 1). Only cancer cases have been excluded. The cases are divided into two main groups: those with lithiasis and those without. Each

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The essentials of the treatment are (1) immediate administration of large doses of sulfanilamide and maintenance of this dosage, (2) intravenous injection of specific antipneumococcic serum, (3) intraspinal injection of the patient's own fresh serum after the establishment of a balance of antibody in the blood, or the use of small doses of specific antiserum, together with fresh human serum, (4) frequent drainage by lumbar puncture

The data in 10 cases of pneumococcic meningitis treated with sulfanilamide alone or with this drug in various combinations with specific serum and complement are presented to illustrate various aspects of the treatment

Six of the patients recovered. The most rapid recoveries occurred in the 4 cases in which the treatment was carried out as outlined above

Further studies in a large number of cases are necessary before the various aspects of this mode of treatment can be properly evaluated

This study was made possible through the most generous co-operation of the members of the visiting and resident staffs of eight different services at the Boston City Hospital who either transferred their cases to the Neurosurgical and Neurological Services or carried out the details of the treatment on their own wards

The surgical operations were performed in Case 2 by Drs P Leo O'Connell and J Paul Tierney, in Case 4 by Drs Walter Wegner and Charles G Freed, in Case 5 by Drs Freed and Rauh, and in Case 7 by Dr Samuel W Garfin. Dr Garfin later permitted his patient to be transferred to the Neurological Service for treatment.

Dr Edward C Curnen assisted in the study of some of these cases. Mrs Mildred W Barnes assisted in the bacteriological and immunological studies. Miss Helene Coffey carried out the chemical studies on the spinal fluids. Miss Marjorie L. Jewell made the determinations of

sulfanilamide. Miss Marion E Lamb and Miss A Kathleen Daley assisted in the bacteriological studies and the type determinations

We are particularly indebted to Dr W G Malcolm, executive director of the Lederle Laboratories, Inc., Pearl River, New York, who provided us with the therapeutic serums used in this study

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pendectomy, a separate lower rectus incision was made. The number of patients who had had a previous appendectomy was not determined. In the stoneless group 159 patients had cholecystectomy and appendectomy and 152 had cholecystectomy alone. The mortality rates for those with and without appendectomy are practically identi-

tical. "Routine" operations are included those dealing directly with the gall-bladder disease, plus appendectomy, because it was so frequently employed. Under "combined" operations are included all other procedures which were performed at the same time. "Combined" is thus used in contrast to "multiple" for the latter term denotes operative

Table 2 *Operative Procedures*

OPERATIVE PROCEDURES	CASES WITH STONES			CASES WITHOUT STONES		
	NO	DEATHS	MOR	NO	DEATHS	MOR
			TALITY RATE %			TALITY RATE %
Cholecystectomy	260	34	13.0	152	12	8.0
Cholecystostomy	26	10	35.0	11	2	18.0
Cholecystectomy and common duct drainage	42	4	9.5	—	—	—
Cholecystectomy and appendectomy	242	21	9.0	159	12	8.0
Cholecystostomy and appendectomy	—	—	—	2	0	0
Common duct drainage only	—	—	—	1	1	100.0
Cholecystectomy and herniorrhaphy	9	0	0	2	1	50.0
Cholecystostomy and herniorrhaphy	1	1	100.0	—	—	—
Cholecystectomy and herniorrhaphy and appendectomy	1	1	100.0	2	1	50.0
Cholecystectomy and posterior gastroenterostomy	6	1	16.0	14	4	28.0
Cholecystectomy and posterior gastroenterostomy and appendectomy	2	0	0	13	2	15.0
Cholecystectomy and posterior gastroenterostomy undone	—	—	—	1	0	0
Cholecystostomy and posterior gastroenterostomy	1	0	0	2	0	0
Cholecystectomy and gastrostomy	—	—	—	5	0	0
Cholecystostomy and gastrostomy	2	0	0	—	—	—
Cholecystectomy and enterocenterostomy	—	—	—	1	0	0
Cholecystectomy and Meckel's diverticulectomy	—	—	—	1	0	0
Cholecystectomy and oophorectomy salpingectomy or hysterectomy	4	0	0	7	0	0
Cholecystectomy and pelvic operation and appendectomy	11	0	0	3	0	0
Cholecystostomy and bilateral salpingectomy	2	0	0	—	—	—
Cholecystectomy and vaginal or cervical operation	3	0	0	4	0	0
Cholecystectomy and vaginal operation and appendectomy	6	0	0	2	0	0
Cholecystectomy and uterine suspension	1	0	0	—	—	—
Cholecystectomy and suspension and appendectomy	1	0	0	—	—	—
Cholecystectomy and hemorrhoidectomy	2	0	0	—	—	—
Cholecystectomy and minor procedures	4	0	0	7	0	0
Cholecystectomy and rib resection and appendectomy	1	0	0	—	—	—
Cholecystectomy tonsillectomy and adenoidectomy	1	0	0	—	—	—
Cholecystectomy and removal of foreign bodies from abdomen	1	0	0	—	—	—
Totals	629	72	11.4	389	35	9.0

cal—7.5 per cent to 7.9 per cent respectively. During the last three years, the rate with appendectomy was 5.8 per cent. The group without stones shows

procedures employed on different occasions perhaps days or weeks apart.

These two groups were then broken down ac-

Table 3 *Gall-Bladder Procedures Combined with Appendectomy*

OPERATIONS	CASES WITH STONES			CASES WITHOUT STONES			ALL CASES		
	NO	DEATHS	MOR	NO	DEATHS	MOR	NO	DEATHS	MOR
			TALITY RATE %			TALITY RATE %			TALITY RATE %
With appendectomy	274	22	8.0	193	14	7.2	467	36	7.7
Without appendectomy	355	50	14.0	196	21	10.7	551	71	12.8

a greater incidence of combined appendectomy because it represents patients with indefinite digestive symptoms and with poor filling and emptying of the gall bladder. At operation the pathological findings around the gall bladder were not extensive, and in a further attempt to explain and improve the symptoms the appendix was explored and removed. It is also in this group of stoneless cases that the poorest subjective results are usually found, this is due in no small measure to the indefinite association of the gall bladder to the symptoms.

The operative procedures were tabulated under routine and combined operations. Under "rou-

ting" to the operative procedures employed in the presence of varying degrees of gall-bladder disease. It was felt that the higher figure for routine operations would thus be explained.

Table 4 *Combined and Routine Operations*

TYPE OF OPERATION	NO	DEATHS	MORTALITY RATE %
Routine	852	92	10.8
Combined	166	15	9.0
Totals	1018	107	10.5

The death rate in acute cholecystitis agrees with that found in many clinics. The low rate of 5.1 per cent in the patients on whom appendectomy was

also performed again brings out the fact that only the best-risk patients were so treated. Cholecystostomy carries a very high mortality rate in this series. In acute cholecystitis the figure is similar to that given by Babcock¹ for the mortality from cholecystostomy. Certainly in this hospital cholecystectomy has given better results in every pathologic group. The high rate is probably due to the fact that the operation was reserved for aged and poor-risk patients. Any procedure on an acutely inflamed, gangrenous gall bladder may be too much for a critically ill patient. Yet cholecystostomy in the chronic conditions carried a higher mortality rate than did cholecystectomy. Even though the procedure was performed under local anesthesia, the shock was still enough to bring death to 1 out of every 3 patients.

From this table it can be seen that while there were only 197 male patients (18 per cent), 41 (38 per cent) terminated fatally. It was believed that it would be of interest to see what pathological grouping would show for the sexes. Men are accused of allowing symptoms to go on for a long time before seeking advice. The table does not bear this out, as more men are found in the stoneless cases, and only a slightly smaller percentage of women than men are found among the more urgent operative types of disease, such as acute, gangrenous and subacute.

Twenty per cent of the men showed acute or subacute pathologic lesions, compared with 16 per cent of the women. On the other hand, 55.7 per cent of the men had no stones, whereas only 36.3 per cent of the women had none. In spite of the

Table 5 *Routine and Combined Procedures by Pathological Findings*

TYPE OF OPERATION	ACUTE			SUBACUTE			CHRONIC WITH STONES			CHRONIC WITHOUT STONES		
	NO	DEATHS	MORTALITY RATE %	NO	DEATHS	MORTALITY RATE %	NO	DEATHS	MORTALITY RATE %	NO	DEATHS	MORTALITY RATE %
ROUTINE												
Cholecystectomy	90	13	14.0	14	1	7.1	156	20	12.5	152	12	7.9
Cholecystostomy	5	1	20.0	—	—	—	21	9	42.8	13	2	16.0
With appendectomy	53	3	5.1	12	1	8.3	172	17	10.2	159	12	7.5
With common duct drainage	6	0	0	2	0	0	34	4	11.7	1	1	100.0
COMBINED												
Gall bladder and gastric	2	0	0	—	—	—	9	1	11.1	37	6	16.1
Gall bladder and pelvic	0	—	—	—	—	—	2	0	0	16	0	0
Gall bladder and miscellaneous	—	—	—	—	—	—	21	2	9.5	11	2	19.0
Totals	161	17	10.5	28	2	7.7	440	53	10.2	389	35	9.0

Appendectomy combined with cholecystectomy shows as low if not lower mortality rates in every pathological group than cholecystectomy alone. It is safe to say that when properly done on a good-risk patient it does not increase the hazard appreciably. In no case could the appendectomy be blamed for death due to sepsis.

Major procedures should not be combined with gall-bladder surgery unless the patient is an excellent risk and the gall-bladder procedure is relatively easy. Except in gastric surgery the results have been fairly good. Yet 2 patients were lost whose extensive ventral hernias were repaired. Herniorrhaphy tends to be a time-consuming operation and may well increase the incidence or the severity of shock. The combining of gastric procedures doubles the risk and should be condemned. The record of 43 vaginal and pelvic procedures without a fatality shows that the cases were well selected. In spite of the favorable figures here shown pelvic procedures should be done at a separate operation.

The sex incidence of the group was determined. The classic distribution shows gall-bladder disease to be four times as frequent among women as among men. Our figures very closely approximate these figures.

fact that the stoneless cases should represent a better operative prognosis, as there should be less liver damage, adhesions and other operative difficulties, the mortality rate among the men was appalling.

Table 6 *Sex Incidence by Pathology*

PATHOLOGICAL CLASSIFICATION	MALES			FEMALES		
	NO	DEATHS	MORTALITY RATE %	NO	DEATHS	MORTALITY RATE %
Acute	33	10	30	128	7	6
Subacute	8	2	25	20	0	0
Chronic with stone	55	14	25	385	39	10
Chronic without stone	101	15	17	258	20	7
Totals	197	41	21	821	66	8

Table 6 shows that men are decidedly poorer risks than women.

The age incidence chart (Fig 1) shows that 45 per cent of the operations occurred in patients from forty to sixty years of age. Another 25 per cent occurred in those aged thirty to thirty-nine. The peak of the incidence occurred in the fifties. The fact that this peak occurs here rather than in the forties, as given in the trilogy "far, fat and forty" is most probably due to postponement of operation for some time after the onset of symptoms. The

average duration of symptoms prior to operation in this series was six years

Youth and old age show a higher percentage of acute than of chronic disease, 12 per cent of the acute cases occurred under twenty years and 55 per cent occurred after seventy, whereas 0.2 per cent of the chronic cases occurred under twenty and 36 per cent after seventy

The death rates show a constant curve in all

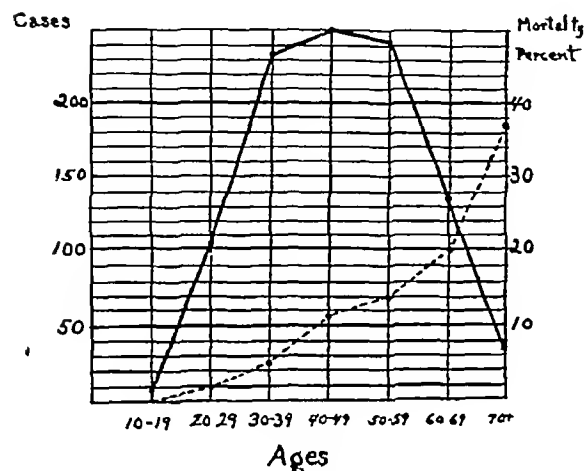


Figure 1 Incidence and Mortality Chart The 1013 cases are charted for number by the continuous line and for mortality percentage by the broken line (the age was doubtful or missing in 5 records) The acute upswing for mortality per cent after the age of sixty is most striking On dividing the cases according to the type of cholecystitis—acute, subacute and chronic—and on charting the number of cases and mortality percentage, similar curves were obtained in each group

types of disease, up to the age of twenty no deaths occurred, from twenty to sixty the slope is constant, from sixty on the curves rise very rapidly, until in the seventies the death rate reaches 35 per cent Except for the subacute group, which is too small to draw conclusions from, there is so little difference in the curves for the different pathological groups that one is tempted when considering operative risks to place more prognostic value on the age of the patient than on the degree of disease

Bearing in mind that men seemed the poorer risks in this series, the age incidence by sexes was determined The average age of the men in the acute group was fifty-eight, in the chronic group fifty-four and in the subacute group fifty-three. The ages of the women were forty-five in the acute group, forty-eight in the chronic group and forty-five in the subacute group The men show from eight to fourteen years advanced age over the women in each group This fact probably has some bearing on the higher mortality rates among the

men Both the highest mortality rate and the greatest average age occurred in the acute group and among the men On the other hand, the lowest mortality rate and the lowest average age occurred in the acute group and among the women The difference in age between the acute male and female cases was almost fourteen years, but it seems unlikely that this difference can account wholly for the twenty-four per cent difference in mortality rates

Age plays an important part in the prognosis of the operative results of gall bladder procedures Patients must be prepared very carefully for operation In elective operations every effort must be made to evaluate cardiac, renal and hepatic efficiency so that each may be brought to as high a state as possible prior to operation In emergency operations one can profitably delay them a few hours so as to make determinations of blood non-protein nitrogen, chlorides, carbon-dioxide combining power and icteric index, and to administer intravenous saline and glucose solutions A carbon-dioxide determination below 36 vol per cent is a definite contraindication to surgery No case is so urgent but that the patient's chances will be improved by immediate operation and hence, a delay in administering supportive treatment The failure to learn this lesson earlier contributed to our high mortality rate in cholecystostomy Many of our fatal cases were operated upon immediately upon hospital entry and death occurred within a few hours after operation, or even on the table If these patients had been given preoperative preparation some might have died unoperated Yet for the majority the operative risk would have been lowered by a preoperative pause to administer fluids, glucose, or even blood, if necessary These principles apply to patients of all ages In people over sixty, since the degenerative processes of age have usually made heavy inroads on stamina, special care is imperative if one is to avoid an appalling mortality rate

An analysis of the fatal cases was made in an effort to determine whether the fatal operations were elective or emergency ones, and whether the diagnosis and basis for operation were determined by clinical or by x-ray findings As shown in Table 7, seventy-three per cent of the deaths occurred in elective operations Sixty-eight per cent of the deaths in stone cases and 82 per cent in stoneless cases were operations of choice The primary symptoms and complaints have not been listed Some of the emergency operations were undertaken under a provisional diagnosis of intestinal obstruction or acute pancreatitis It was only at operation that the true nature of the disease was found

The preoperative stay of the fatal stone cases averaged four days and of the stoneless cases three. However, 54 of the 107 fatal cases were in the hospital less than twenty-four hours before operation. Such a stay is too brief for adequate preparation for operation, or for proper evaluation of its necessity, and must be discouraged.

X-ray studies were recorded in 30 stone cases and 13 stoneless cases which resulted in death. A positive x-ray diagnosis was made the apparent

Table 7 *Analyses of 107 Fatal Cases*

	DEATHS	WITH STONES	WITHOUT STONES
Elective operations	78 (73.0%)	49 (68.0%)	29 (82.0%)
Emergency operations	29 (27.0%)	23 (32.0%)	6 (18.0%)
Totals	107	72	35

basis for operation in 18 of the former and 10 of the latter. In the early years of this series the Graham test was not in use. Some of the patients had received x-ray studies at other clinics. In the last four years practically every patient had had some x-ray study. In 28 cases x-ray evidence rather than the clinical story swayed the decision to operate.

Table 8 *Causes of Death (Primary Cause on Death Certificates)*

Pneumonia (broncho-lobar and hypostatic)	23
Cardiac (myocarditis coronary disease)	18
Peritonitis (local or diffuse)	16
Shock (surgical)	9
Bowel obstruction or paralytic ileus	5
Nephritis (acute and chronic)	7
Sepsis (general)	6
Hemorrhage	4
Embolus	4
Acute hemorrhagic pancreatitis	2
Diabetes	2
No cause other than operation	11
Total	107

31 per cent of these cases were autopsied.

The causes of death (Table 8) are those usually associated with abdominal surgery. Pneumonia, peritonitis and cardiac failure accounted for over half the fatalities. The depredations of degenerative disease, such as generalized arteriosclerosis, coronary sclerosis, chronic vascular nephritis and myocardial fibrosis, were frequent contributors. Hemorrhage, which is usually considered a severe and frequent complication of gall-bladder surgery, caused only 4 deaths.

Among the 161 acute cases there were 17 deaths. Of these 6 occurred following perforation of the gall bladder, 8 after gangrene and 1 after empyema of the gall bladder. Only 2 of the fatal cases showed no septic complications, as 1 patient died from hemorrhage and 1 from surgical shock. In 15 death was caused by sepsis, the patients showing late phases of an acute process. All these cases had been treated expectantly at home or in

the hospital. Early operation, after the administration of restorative fluids, would at least have avoided the occurrence of perforation. Whether the mortality rate would have still remained as high if earlier operation had been attempted is a matter of conjecture. There has been considerable discussion of late concerning the proper handling of acute cholecystitis as to whether operative interference should be early or delayed. This question cannot be answered here, but we can point to a group of severe complications which resulted from too great delay in operating. The expectant or delayed operative treatment of acute cholecystitis must be carried out with the frequent occurrence of complications due to gangrene and perforation ever in mind. No rule can be formulated, but a waiting course is justified only if improvement is taking place.

CONCLUSIONS

From the foregoing material the following conclusions and recommendations can be drawn.

The procedures of cholecystectomy and cholecystostomy must still be considered serious operations, with potentialities for a high mortality rate.

Appendectomy is unlikely to increase the operative risk if cases are properly selected.

Gall-bladder operations combined with any other major procedure carry too great a hazard to justify them except in distinct emergencies.

In cases presenting multiple surgical diseases a two-stage operation should be done, the more urgent condition being treated at the first operation and the less urgent condition two or more weeks later.

Women are better operative risks than men. In this series there was a higher incidence of operations and a lower mortality rate among women.

Gall-bladder surgery in people over sixty carried a mortality rate of from 25 to 40 per cent, increasing with age. In this age group, particularly, the severity of symptoms must be weighed carefully before incurring the risks of surgery. Elective operations must be deferred until the patient's general condition has been brought to its optimum.

The incidence of stoneless cases (38 per cent) is high, and these cases showed a mortality rate of 9 per cent. No case of acute cholecystitis occurred in a stoneless gall bladder. Perhaps this aithic group should be considered mainly a medical problem.

Operations of choice should reflect a low mortality rate. Such operations in our series did not

By taking the following steps the mortality rate in this hospital has been lowered from 12.2 per cent in 1924 to 6.5 per cent in 1933

The indications for operation must be specific stones and a history of colic or of extra-hepatic jaundice are the more important. A clinical history of colic plus positive cholecystograms is always an indication. In the absence of a history of colic, a cholecystogram which shows poor filling and emptying should be repeated. If such findings recur, medical treatment is indicated. If this fails to bring improvement in gall-bladder function, surgery is indicated.

The preoperative evaluation of cardiac, hepatic and renal function must be thorough. The preoperative care must be sufficient to

bring the patient to the optimum condition possible.

The operative procedures must be simple, gentle and not unduly prolonged.

The anesthesia and postoperative care must be planned to reduce pulmonary complications.

In acute conditions of the gall bladder, operation must not be delayed until complications resulting from gangrene and perforation have developed. Acute cholecystitis should be considered from its onset a surgical disease requiring very close observation.

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FAILURE OF NICOTINIC ACID IN THE TREATMENT OF ANEMIA

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DURHAM, NORTH CAROLINA

NICOTINIC acid and nicotinic acid amide have been isolated from liver^{1, 2} and have been used successfully in the treatment of experimental, canine black tongue^{2, 3} and of human pellagra^{4, 5, 6}. Since this drug may well be used extensively as a therapeutic agent in pellagra and perhaps in other deficiency states, it has seemed advisable to observe its effects in various types of anemia. In this paper will be reported the essentially negative effect of nicotinic acid (Eastman) when administered parenterally to 7 patients: 3 with pernicious anemia, 1 with hyperchromic anemia and liver disease, 1 with idiopathic hypochromic anemia and 2 with myeloid leukemia.

In experimental work on canine black tongue it was found that the results obtained from the injection of 1 mg. of nicotinic acid per kilogram of body weight daily for ten days were comparable with the best results obtained by the use of liver.⁸ Each of our 7 patients was given 60 mg. of nicotinic acid daily, by intramuscular or by intravenous injection. In 2 cases an evanescent flushing and subjective feeling of warmth followed the first of several injections. No other reactions were observed. In addition to frequent peripheral blood counts, cell counts were done directly on material aspirated from the sternal bone marrow. The ma-

terial withdrawn was kept from clotting by the addition of suitable amounts of crystalline potassium oxalate.

Case 1 A white female, 42 years of age, was admitted with the diagnosis of pernicious anemia and subacute combined degeneration of the spinal cord. Symptoms began 7 years before entry.

The blood showed a red-cell count of 2,500,000 with a hemoglobin of 67.7 (10.5 gm.) per cent. The color index was 1.35, and the MCV 122.5 μ^3 . The white-cell count was 5320 with 66 per cent polymorphonuclears, 1 per cent large lymphocytes, 26 per cent small lymphocytes, 4 per cent eosinophils, 1 per cent basophils and 2 per cent monocytes.

A stained smear revealed anisocytosis and poikilocytosis, with a predominance of macrocytic red cells. No immature cells were seen. The bone marrow picture as revealed by several sternal punctures was characteristic of that seen in pernicious anemia; the white-cell count was 50,000, with 1.5 per cent reticulocytes, all macrocytic. Blood Wassermann and Kahn tests were negative. Gastric analysis showed no free hydrochloric acid after stimulation with 5 mg. of histamine. On lumbar puncture the spinal fluid was clear and the pressure normal. The cell count, Pandy reaction, benzidine test and spinal fluid Wassermann were all negative. X-ray studies of the chest and abdomen revealed nothing of note.

The daily intramuscular injection of 60 mg. of nicotinic acid for 10 days had no significant effect on the peripheral blood (Chart 1), but parenteral liver therapy had a subsequent positive effect. The patient became progressively weaker and the neurologic changes more pronounced. After 1 week of treatment with nicotinic acid, the bone-marrow white-cell count had fallen to 17,000. This relatively low count persisted for 10 days after the nicotinic

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The blood showed a red-cell count of 4,500,000 with a hemoglobin of 85 (13.2 gm) per cent. The color index was 0.95, the MCHC 29.6 $\times 10^{-12}$ gm., and the MCV 85.5 μ^3 . The white-cell count was 200,000 with 35 per cent segmented polymorphonuclears, 32 per cent "staff" polymorphonuclears, 9 per cent juvenile polymorphonuclears, 1 per cent eosinophils, 18 per cent neutrophilic myelocytes, 1 per cent myeloblasts, 1 per cent large lymphocytes, 2 per cent small lymphocytes and 1 per cent monocytes. There were no immature red cells. Reticulocytes were estimated at less than 1 per cent. The basal metabolic rate was $\pm 1\%$ per cent.

The daily intravenous injection of 60 mg of nicotinic acid for 8 days caused no change in the white-cell count and no appreciable change in the differential white-cell formula or the hemoglobin or red-cell levels.

DISCUSSION

Although it seems well established that nicotinic acid contains a growth-promoting factor, and perhaps the pellagra-preventing factor of Goldberger, it had no antianemic value whatsoever in the instances cited here. The only hematologic change observed was a temporary depression of myeloid function, as indicated by a drop in the bone-marrow white-cell count. This fall was not mirrored in the white count or in the Schilling hemogram of the peripheral blood. On the other hand, it has been observed¹⁰ that in rats on diets deficient in the vitamin B complex, the addition of nicotinic acid will prevent the development of a nutritional pancytopenia. Nicotinic acid apparently had no effect on the platelet count. Thrombopenia in the

cases of Addison-Biermer anemia, when present, persisted until the institution of liver treatment.

SUMMARY

Nicotinic acid, in dosages known to be clinically effective in pellagra, was used in 3 cases of Addison-Biermer anemia, 1 case of hyperchromic anemia and liver disease, 1 case of idiopathic hypochromic anemia, and 2 cases of myeloid leukemia.

In such amounts nicotinic acid had no effect on the anemia or clinical course of any of these patients.

The injection of nicotinic acid was followed in each instance by a fall in the bone-marrow white-cell count.

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NEW HAMPSHIRE MEDICAL SOCIETY

PROCEEDINGS OF THE
ONE HUNDRED AND FORTY-SEVENTH ANNIVERSARY

HOUSE OF DELEGATES

MAY 16, 17 AND 18, 1938

THE House of Delegates convened at the Hotel Carpenter, Manchester, on Monday evening, May 16, 1938, at seven-thirty o'clock, with Speaker Richard W. Robinson, of Laconia, presiding.

The following members answered the roll call

The President, ex-officio
The Vice-President, ex-officio
The Secretary-Treasurer, ex-officio
Chester L. Smart, Laconia
A. Philip LaFrance, Laconia
William J. Paul Dye, Wolfeboro
Francis J. C. Dube, Center Ossipee
Osmon H. Hubbard, Keene
Norris H. Robertson, Keene
William M. Bronson, Lancaster
Edgar J. Thibodeau, Berlin
Robert M. Deming, Glencliff
Leslie K. Sycamore, Hanover
Deering G. Smith, Nashua
Clarence E. Dunbar, Manchester
George V. Fiske, Manchester
Luther A. March, Nashua
Herbert B. Messenger, Franklin
Warren H. Butterfield, Concord
Oscar B. Gilbert, Exeter
Fred Fernald, Nottingham
Edna Walck, Dover
Henry C. Sanders, Jr., Claremont
Addison Roe, Newport
George C. Wilkins, Manchester
Henry O. Smith, Hudson
Robert O. Blood, Concord
Emery M. Fitch, Claremont
Frederic P. Lord, Hanover

SPEAKER ROBINSON The first order of business is the reading of the minutes of the last meeting.

DR. DUBE I move that the reading of the minutes of the last meeting be omitted.

This motion was seconded and was carried.

SPEAKER ROBINSON The next business is the appointment of a Committee on Credentials. I appoint Chester L. Smart, Francis J. C. Dube, Edgar J. Thibodeau and Clarence E. Dunbar.

The Committee on Officers' Reports was appointed prior to this meeting, with Herbert B.

Messenger as chairman and Deering G. Smith and Fred Fernald as members, the Committee on Memorials and Communications with William J. Paul Dye as chairman and Edna Walck and Clarence E. Dunbar as members.

For the Committee on Nominations, I now appoint Leslie K. Sycamore as chairman and Henry C. Sanders, Jr., Wendell P. Clare, Charles H. Cutler and Osmon H. Hubbard as members.

We are going to interrupt the regular order of business at this time in order to introduce Mr. Smith, superintendent of the Mary Hitchcock Hospital, and Miss Mary L. Whittaker of the Margaret Pillsbury Hospital, who will talk to us about group hospitalization insurance.

MR. SMITH Group hospitalization is very much of a baby, being only about four years old. It was begun in Dallas, Texas, and it gradually spread through the Middle West, and to the East Coast, and last year saw the formation of the Massachusetts group.

At one time, it was thought that we might have the Massachusetts plan extend up through northern New England. The Massachusetts plan and the New York plan are not operated by the hospitals but by men interested in hospitals, who have given money as a financial back-log to tide them over the first two or three years, when claims usually exceed the premiums.

Another plan is the formation of a company by interested individuals, which would be financially backed, so far as claims are concerned, by an insurance company. This latter plan seems, in many respects, to be more satisfactory.

We should like to know what the reaction of the medical association of this state is regarding group hospitalization. It is a big problem and one that depends for its success on the medical profession.

SPEAKER ROBINSON The meeting is now open for questions.

SECRETARY MFTCALF If this is backed by an insurance company, is there any assurance that the rate will not be raised?

MR. SMITH Only to this effect the plan itself has been incorporated by two individuals as the

New Hampshire Hospital Plan The State laws require that 79 per cent of all income must be set up as a reserve to pay possible claims. If the claims are greater than that, there might be a raise. If the claims are less, that percentage has to stay in a reserve, which is under the supervision of the State Insurance Commissioner. The insurance company acts merely as an underwriting agency. The plan will be administered, as we get the story from Mr. Kendall and Mr. Glines, with an advisory committee composed of representatives from the medical group, from the hospital group and from the lay group.

SECRETARY METCALF How soon would you like to start it?

MR. SMITH We are willing to take our time and be sure it is correct. These two gentlemen are very anxious to get it started. The hospitals are more interested in starting something that will be of greater value ten years from now than it will be, let us say, three years from now.

SPEAKER ROBINSON Miss Whittaker, would you like to speak on this subject?

MISS WHITTAKER I have nothing to add to what Mr. Smith has told you, other than that we have negotiated for the past month with the Vermont Accident Insurance Company. Their representative, Mr. Glines, could present the program which they have to offer, if you desire to have him do so.

SECRETARY METCALF Mr. Glines, will you tell us, briefly, what you told me the other day in my office?

MR. GEORGE B. GLINES Our first approach, after outlining the plan, was to contact the State Insurance Department in order to find out if such a plan could be adopted for New Hampshire. We found that the New Hampshire laws interpret hospitalization as a form of insurance and the Attorney-General has ruled that it must come under the State Insurance Department and that a non-profit plan, so-called, could not be organized in New Hampshire under our present laws.

I have a copy of the policy here. The items are as follows:

1 Each eligible subscriber is entitled to receive hospital care for a total of not more than twenty-one days on one or more admissions during the first contract year. After having been a subscriber for twelve months, he will be entitled to receive hospital care for not more than thirty days during the contract year. Hospital care shall be rendered to the subscriber upon the recommendation of a

physician. He must be a licensed practitioner of medicine and acceptable to the hospital selected.

2 In the event of an accident or other emergency requiring hospitalization at a hospital outside of New Hampshire, members are entitled to receive a credit of six dollars per day against the usual hospital charges. Should a subscriber elect to receive hospital care provided at a New Hampshire hospital which is not a member of the Hospital Service of New Hampshire, he shall be entitled to receive benefits of five dollars per day, subject to all agreements and exclusions therein contained.

3 Hospital care includes board in a semi-private room and care for twenty-one days, on one or more admissions, use of operating and delivery room, cost of anesthesia to a maximum of ten dollars, ordinary medications and dressings, routine laboratory and pathological service, and general nursing service. Obstetric care shall include any condition resulting from pregnancy, the care of the mother and the ordinary nursing care of the newborn child.

4 The agreement does not include hospital care for the treatment of any ailment of which the subscriber had knowledge at the time the subscription application was completed, pulmonary tuberculosis, after diagnosis as such, venereal disease, nervous and mental diseases, workmen's compensation cases, quarantinable diseases, alcohol or drug addiction. Hospital care arising from pregnancies is not covered until husband and wife have been subscribers for ten consecutive months preceding the culmination of pregnancy.

5 The agreement does not cover services or fees of physicians, surgeons or special nurses or their board, nor does it cover payment of x-ray diagnosis or other special services provided by the hospital.

6 Hospital care beyond the twenty-one-day period will be furnished by member hospitals at a discount of twenty per cent, not to exceed a twenty-eight-day period in any one contract year. Should a member desire more expensive accommodations, a credit of \$5.00 per day toward such accommodations shall be allowed.

This is all under the jurisdiction of the State Insurance Department, as I stated before.

There are some provisions here which are the standard provisions required by law for this type of insurance.

One of the usual provisions in a similar policy would be to the effect that all indemnities are payable to the insured, but that would defeat the purpose of this plan, which is that hospitals may be assured of their money. So, after several con-

ferences with the State Insurance Department and the Attorney-General's Office, we were permitted to accomplish a change. All indemnities in this policy are payable to the member hospital furnishing care. The Attorney-General, under the law, is permitted to allow such a change, if it works out to the benefit of the insured person, because the insured person is to receive a 20 per cent discount after the period of hospitalization which is covered under the contract is exhausted, he has ruled that the change does work out to the benefit of the insured person. It has also been approved by the State Insurance Department.

There is a paragraph in the contract, also, which states that the subscriber consents that a diagnosis of a physician and a medical record of the subscriber's hospitalization may be furnished to and used by the company for statistical, actuarial and other legitimate purposes.

Another clause specifies that all benefits of the policy shall cease at the time the subscriber is notified by the attending physician that hospitalization is no longer necessary and that the subscriber shall be responsible to the hospital for payment of all charges incurred after date of such notice.

The next clause states that the subscriber making application for hospitalization insurance does not anticipate that he or his family, at the time of the making-out of the application, is in need of hospital care. Such a clause is necessary, because no medical examination is required.

This is a group policy and will only be issued in groups of a minimum of five, or larger groups, if possible. We intend first to contact the employer for groups. If the plan meets with his approval, we shall make an attempt to form the first group in the organization. It may be a large organization or a small one. But the first group would be instituted by securing office employees and heads of departments. After we have an entree into the plant, we can leave circulars with the employer to be distributed among the employees. The circular will outline the coverage under the contract, and the cost to the insured person.

An employed person is the person who must apply, that employed person may be a man or a woman. The first person taking out the insurance—the employed person—must pay ten dollars a year, the second person in that family may be insured for eight dollars additional, and the other members of that person's family, up to nineteen years of age, may be insured for six dollars each, regardless of number.

There is a fifty-cent subscription fee for the first application, and there is no other fee for the

other members of the family, outside of the amounts I have just given you.

SPEAKER ROBINSON This does not include any x-ray work done in the hospital?

MR GLINES No.

SPEAKER ROBINSON How about blood transfusions?

MR. GLINES They would not come under this contract.

These provisions have been drawn up in cooperation with the President of the State Association of Nursing Superintendents and the hospital superintendents, and Mr. Smith, of the Mary Hitchcock Hospital in Hanover, has made an intensive study of all the plans which are in effect today. This plan is the result of several conferences.

DR DUBE By groups of five, do you mean these people have to be employed by a certain person? Suppose, in a small town, there were five different individuals who wished to subscribe.

MR GLINES We believe that a situation of this sort can be handled very nicely. Let us take an illustration. An office organization has a potential group, but all members might not wish to come in right away. We will put the applications on file. When we have a group of five, we shall then issue a group certificate to each one.

MR SMITH I think what the doctor meant was this. If you have an office where three people want to join, how about the other two members needed to make up the group of five?

MR GLINES In that case, I believe we shall find that there may be two or three stores or employers engaged in practically the same line of business, and we could combine those under one group. Then we should have a group of five and probably more.

With reference to the farmer and his group, they all have their state organizations, and many of them are members of either the Grange or the Farm Bureau. We should approach those people through the head of their organization.

DR DUBE I meant by my question, suppose five people of different groups wished to have the benefits of such a policy. Let us suppose that a doctor, a lawyer, an oil man and a garage man wanted to get together and make a group of their own. What then?

MR GLINES I do not see any objection to that, if that is the only way to handle the matter. But

I think the most acceptable way would be to combine classifications in one group, rather than several different classifications of employment in the same group

DR. DYE Suppose you have an individual family under five members who want this type of policy What then?

MR. GLINES The first member of the family to apply must be the employed member, the second would be the husband or wife, and that would be the eight dollars additional charge, and then to include all other members of the family, regardless of the number, up to nineteen years of age, it would cost six dollars each

DR. DYE Is it essential that the head of the family be employed? Suppose the head of the family is retired

MR. GLINES There would be no objection to that But the fundamental reason for the issuance of these group policies is to make them within the reach of the average man, and handled on a payroll deduction basis, so it is easy to make payments, if the payments were to be made quarterly or semi-annually or annually, there would be more of a chance to omit payments

We do not intend to commercialize this plan in any way, through commissioned agents All the field work and soliciting, if you call it soliciting, will be done by salaried men under our own supervision, so that we shall have control of them at all times, and can direct their activities along the lines we feel most advisable We do not plan to use high pressure It is merely our idea to inform people of the fact that the plan is available and within their reach, through a payroll deduction

We use a master card for each employer, and file it under the town or the industry of the employer, then, as additional groups are formed, they can come in at any time In most cases, such groups will be on a monthly deduction basis

QUESTION Is this contract cancelable?

MR. GLINES If the subscribers do not continue their payments, they are automatically dropped from the list If such a person comes in again, he would have issued to him a new certificate, with the fifty-cent enrollment fee We hope to have very few cancelations

QUESTION Can the insurance company cancel a man's policy?

MR. GLINES No, we have no reason to cancel We could, I suppose, under the law

QUESTION What if they elect to go out of the State for their hospitalization?

MR. GLINES The contract is so drawn that it favors New Hampshire hospitalization above all others One gets much better hospitalization in New Hampshire than he could get in any other State

DR. D. G. SMITH This covers the anesthesia, but does it cover the services of the physician?

MR. GLINES No We do not pay any doctors' fees We allow ten dollars to the member hospital for anesthesia

MR. SMITH We have attempted all the time to keep physicians' fees out of it, both in the x-ray departments and the medical laboratory departments, as well as anesthesia and everything else We have attempted to make it in accordance with the suggestion of the American Medical Association It does not include any physicians' fees of any kind

DR. SANDERS I move that this matter of group hospitalization insurance be referred to the Committee on Memorials and Communications

This motion was duly seconded

MR. GLINES May I say just one more word We should like to organize and, through you doctors, obtain two members for an advisory board In other words, we should like two members from the State Hospital Association, two from the New Hampshire Medical Society, and two public-spirited men, so that we may get the best plan possible and have it work effectively

The motion was unanimously carried

SPEAKER ROBINSON The next order of business is the report of the Secretary-Treasurer

Report of Secretary-Treasurer

The following report for the year 1937 is herewith submitted

Membership, December 31, 1937

	PAID
Bellnap County	31
Carroll County	14
Cheshire County	27
Coos County	28
Grafton County	55
Hillsboro County	126
Merrimack County	68
Rockingham County	47
Strafford County	33
Sullivan County	17
Not in county society	6

ferences with the State Insurance Department and the Attorney General's Office, we were permitted to accomplish a change. All indemnities in this policy are payable to the member hospital furnishing care. The Attorney General, under the law, is permitted to allow such a change, if it works out to the benefit of the insured person; because the insured person is to receive a 20 per cent discount after the period of hospitalization which is covered under the contract is exhausted, he has ruled that the change does work out to the benefit of the insured person. It has also been approved by the State Insurance Department.

There is a paragraph in the contract, also, which states that the subscriber consents that a diagnosis of a physician and a medical record of the subscriber's hospitalization may be furnished to and used by the company for statistical, actuarial and other legitimate purposes.

Another clause specifies that all benefits of the policy shall cease at the time the subscriber is notified by the attending physician that hospitalization is no longer necessary and that the subscriber shall be responsible to the hospital for payment of all charges incurred after date of such notice.

The next clause states that the subscriber making application for hospitalization insurance does not anticipate that he or his family, at the time of the making out of the application, is in need of hospital care. Such a clause is necessary, because no medical examination is required.

This is a group policy and will only be named in groups of a minimum of five, or larger groups, if possible. We intend first to contact the employer for groups. If the plan meets with his approval, we shall make an attempt to form the first group in the organization. It may be a large organization or a small one. But the first group would be instituted by securing office employees and heads of departments. After we have an entree into the plant, we can leave circulars with the employer to be distributed among the employees. The circular will outline the coverage under the contract, and the cost to the insured person.

An employed person is the person who must apply, that employed person may be a man or a woman. The first person taking out the insurance—the employed person—must pay ten dollars a year, the second person in that family may be insured for eight dollars additionally, and the other members of that person's family, up to nineteen years of age, may be insured for six dollars each, regardless of number.

other members of the family, amount, I have just given you.

SPEAKER ROBINSON: This does it say work done in the hospital?

MR. CHASE: No.

SPEAKER ROBINSON: How about monies?

MR. CHASE: They would not contract.

These provisions have been drawn in operation with the President of the Union of Nursing Superintendents, the superintendents, and Mr. Smith, of the Cook Hospital in Hanover, has in view study of all the plans which today. This plan is the result of these.

DR. DUFF: By group, of five, these people have to be employed person? Suppose, in a small town, a different individuals who wished it.

MR. CHASE: We believe that this sort can be handled very nicely in illustration. An office organization, but all members must come in right away. We will put them on file. When we have a group we shall then issue a group certificate.

MR. SMITH: I think what the was this. If you have an office where people want to join, how about the others needed to make up the group?

MR. CHASE: In that case, I believe find that there may be two or three employers engaged in practically the same business, and we could combine the group. Then we should have a group probably more.

With reference to the former, in they all have their state organization of them are members of either the C. Farm Bureau. We should approach through the head of their organization.

DR. DUFF: I meant by my question five people of different groups wished benefits of such a policy. Let us say doctor, a lawyer, an oil man and a wanted to get together and make a group. What then?

I think the most acceptable way would be to combine classifications in one group, rather than several different classifications of employment in the same group

DR. DYE Suppose you have an individual family under five members who want this type of policy What then?

MR. GLINES The first member of the family to apply must be the employed member, the second would be the husband or wife, and that would be the eight dollars additional charge, and then to include all other members of the family, regardless of the number, up to nineteen years of age, it would cost six dollars each

DR. DYE Is it essential that the head of the family be employed? Suppose the head of the family is retired

MR. GLINES There would be no objection to that But the fundamental reason for the issuance of these group policies is to make them within the reach of the average man, and handled on a payroll deduction basis, so it is easy to make payments, if the payments were to be made quarterly or semi-annually or annually, there would be more of a chance to omit payments

We do not intend to commercialize this plan in any way, through commissioned agents All the field work and soliciting, if you call it soliciting, will be done by salaried men under our own supervision, so that we shall have control of them at all times, and can direct their activities along the lines we feel most advisable We do not plan to use high pressure. It is merely our idea to inform people of the fact that the plan is available and within their reach, through a payroll deduction

We use a master card for each employer, and file it under the town or the industry of the employer, then, as additional groups are formed, they can come in at any time. In most cases, such groups will be on a monthly deduction basis

QUESTION Is this contract cancelable?

MR. GLINES If the subscribers do not continue their payments, they are automatically dropped from the list If such a person comes in again, he would have issued to him a new certificate, with the fifty-cent enrollment fee We hope to have very few cancellations

QUESTION Can the insurance company cancel a man's policy?

MR. GLINES No, we have no reason to cancel We could, I suppose, under the law

QUESTION What if they elect to go out of the State for their hospitalization?

MR. GLINES The contract is so drawn that it favors New Hampshire hospitalization above all others One gets much better hospitalization in New Hampshire than he could get in any other State

DR. D. G. SMITH This covers the anesthesia, but does it cover the services of the physician?

MR. GLINES No We do not pay any doctors' fees We allow ten dollars to the member hospital for anesthesia

MR. SMITH We have attempted all the time to keep physicians' fees out of it, both in the x-ray departments and the medical laboratory departments, as well as anesthesia and everything else We have attempted to make it in accordance with the suggestion of the American Medical Association It does not include any physicians' fees of any kind

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This motion was duly seconded

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The motion was unanimously carried

SPEAKER ROBINSON The next order of business is the report of the Secretary-Treasurer

Report of Secretary-Treasurer

The following report for the year 1937 is herewith submitted

Membership, December 31, 1937

	PAID
Belknap County	31
Carroll County	14
Cheshire County	27
Coos County	28
Grafton County	55
Hillsboro County	126
Merrimack County	68
Rockingham County	47
Strafford County	33
Sullivan County	17
Not in county society	6

	UNPAID
Affiliate Members	24
Honorary Members	12
Total	488

The total membership on December 31, 1936, was 491

FINANCIAL STATEMENT

Receipts

January 1, 1937 Balance forward	\$726.36
Merrimack County refund	5 00
Cancer Commission refund	22 30
Net receipts 1937 annual meeting	464.95
Belknap County	198 00
Carroll County	84 00
Cheshire County	164 00
Coos County	184 00
Grafton County	331.50
Hillsboro County	839 00
Merrimack County	407 00
Rockingham County	316 00
Sullivan County	115 00
Strafford County	192 00
Benevolence Fund (Women's Auxiliary)	40 00
Members not in county societies	36 00
<i>New England Journal</i> subscriptions	9 00
Cash received at annual meeting	7 00
	<hr/>
	\$4141 11

Expenditures

<i>New England Journal of Medicine</i> (copies to members)	\$525 49
<i>New England Journal of Medicine</i> (full subscriptions, Drs Dinerman, Burian and Bogle)	9 00
<i>New England Journal of Medicine</i> (reprints, Dr Stroud)	10 45
<i>New England Journal of Medicine</i> (tabular matter, Dr Arnold)	2 10
<i>New England Journal of Medicine</i> (transactions)	529 12
Carleton R. Metcalf (salary)	400 00
Bridge and Byron (printing)	101 25
Postage and envelopes	85 04
Clerical work	84.50
Cyril J. Fretwell (legislative bills)	5 00
Eagle and Phoenix Hotel (committee lunches)	80 10
R. O. Blood, treasurer (part payment on typewriter)	25 00
R. O. Blood, treasurer (telephone and telegraph calls)	23 60
Union Leader Co (half-tone cuts, obituaries)	11.92
Clifton S. Abbott (Belknap Co refund, on affiliate members)	6 00
Commonwealth Fund expenditures	37.97
The Robbins Company (gold medal)	15 24
Women's Auxiliary	100 00
Benevolence Fund	197 00
Frank J. Sulloway (retaining fee)	100 00
Dr George C. Wilkins (Cancer Committee)	50 00
Dr Burrill B. Crohn (expenses, annual meeting)	21 90
Dr J. Dellinger Barney (expenses, annual meeting)	10 00
Dr Warren T. Vaughan (expenses, annual meeting)	64 00
Dr Anton J. Carlson (expenses, annual meeting)	22 50

Dr Ralph E. McDonnell (expenses, annual meeting)	14 00
Dr Clyde L. Deming (expenses, annual meeting)	14 00
Dr E. Ross Mintz (expenses, annual meeting)	10 00
Dr Warren H. Butterfield (dues collected at annual meeting)	21 00
Dr Wendell P. Clare (dues collected at annual meeting)	28 00
Dr Henry C. Sanders, Jr (dues collected at annual meeting)	7 00
Dr Deering G. Smith (dues collected at annual meeting)	70 00
Dr Frederick P. Scribner (toll calls at annual meeting)	1 15
Madelene A. May (stenographer, annual meeting)	249.54
Dr Deering G. Smith (delegate, A. M. A.)	75 65
Dr Robert N. Jones (county dues)	4 00
Dr Warren H. Butterfield (county dues)	2 00
Dr John J. Brosnahan (county dues)	2 00
Dr Leslie K. Sycamore (county dues)	1 50
Dr Deering G. Smith (county dues)	1 00
Dr Henry C. Sanders (to replace check No 758 for dues)	7 00
Newspapers	12.95
	<hr/>
1937 dues deposited 1/14/38	84 00
	<hr/>
	\$3198.97
January 1, 1938 Balance in check book	942.14
	<hr/>
	\$4141 11

The society is in good financial condition with all debts paid and a balance of nearly a \$1000 in the bank. The Benevolence Fund on December 31, 1937, amounted to \$1701.24. During the past year we received from the Women's Auxiliaries \$40.00 for this fund.

No officers of the society have died during the past year. Among the members whom we lost was Dr. Mary S. Danforth, of Manchester, said to be the oldest woman physician in New England. Dr. Danforth received the fifty year medal from this society in 1928.

For the two appointive offices which lie within the province of your president, Dr. Ladd chose these men for anniversary chairman, Chester F. McGill, of Portsmouth, and for member of the New England Medical Council, Harry O. Chesley, of Dover.

I can report as follows concerning the recommendations which were made by the House of Delegates last year.

1. The so-called Vermont plan of malpractice insurance was studied by a subcommittee of the Advisory Committee on Jurisprudence, this subcommittee feels that it is inexpedient to adopt the Vermont plan at the present time.

2. A check for one hundred dollars was sent to Mr. Frank J. Sulloway in return for his work with the Advisory Committee on Jurisprudence and for the free consultation that he has made available to every member of the society. From the wording of the resolution concerning this fee at last year's meeting of the House of Delegates, I assume that a similar sum should be sent to Mr. Sulloway annually until further notice.

3. Your secretary sent to the Surgeon General of the Public Health Service a letter expressing the desire of this society to co-operate in the attempt to eliminate tropical diseases. The Committee on Public Relations of

ferred its services to the State Board of Health for this same purpose.

4 The Committee on Mental and Social Hygiene has been asked to render a report at this time in regard to simpler methods of procedure for the sterilization of mentally deficient persons. This same committee has been asked to report also on the desirability of changing the method of commitment to the New Hampshire State Hospital.

5 Your secretary brought to the attention of the several county secretaries a recommendation that the President of the Society be asked to visit each county society and a further recommendation that it might be desirable to make the county secretaries members of the House of Delegates. Because of these two recommendations, the President of the Society has had numerous invitations and we now have in the House of Delegates seven of the ten county secretaries.

6 The chairman of the Committee on Medical Education and Hospitals was asked to prepare a revised list of the Speakers Bureau and to furnish copies of this list to the several county secretaries.

7 Two important bills which received the approval of this House of Delegates were passed at the most recent session of the State Legislature. The first bill requires the presentation of a negative blood test for syphilis before the issuance of a marriage license. This bill takes effect on October 1, 1938. The second bill requires that all physicians establishing practice in New Hampshire shall have at least one year's internship approved by the Board of Registration in Medicine. A third important bill, which was passed but which did not come officially before this House of Delegates, requires that a suit for malpractice must now be brought within two years of the alleged offense.

8 The State Board of Health was notified that this society believed that approval should not be given to lying-in hospitals unless they met certain requirements enumerated by the Committee on Maternity and Infancy.

9 The State Board of Health was further advised that the House of Delegates approved the pneumonia program which is in effect in Massachusetts and hoped that a similar program could be inaugurated in New Hampshire. This step has now been taken. Free pneumonia serum is available for persons afflicted with this disease and arrangements are being made to provide the necessary laboratory facilities in various parts of the State. A short reel, illustrating the use of pneumonia serum, has been shown in moving picture houses.

10 The question of group hospitalization was referred to the Hospital Superintendents Club.

The work of some of our more important committees deserves mention.

The Publication Committee has again had its troubles. Addresses at the annual meeting which are given extemporaneously are not suitable for the *New England Journal of Medicine* and it is often difficult to get the speaker to write his address in simplified language. The net result is that two addresses which were given at our meeting in 1937 did not appear in the *Transactions*. The column "Miscellany" which for two or three years has been printed in the *New England Journal of Medicine* is now being edited, not by your secretary, but by Dr. Fred E. Clow, of Wolfeboro. You have no doubt noticed the improvement.

The Advisory Committee on Jurisprudence has held three or four meetings this year. All prospective or actual suits against members who are insured in the Hart-

ford Accident and Indemnity Company are now referred directly and immediately to Mr. Sulloway. Such suits are being handled expeditiously and are being reviewed promptly by the committee, in fact there are no suits now pending which the committee has not considered. The number of suits has decreased. It is possible that the Hartford Company will be able to offer a lower premium rate.

An attempt was made this year to hold a meeting of the New England Medical Council to consider the present social trend of medical practice. Massachusetts gave a lukewarm approval of such a meeting, but all the other New England States refused to attend. It seems to me an idle gesture for us to appoint annually a group of men for a council which presumably will never meet.

When the appointment of a Committee on Medical Economics was considered a few years ago, Dr. Henry O. Smith, of Hudson, said that such a committee was unnecessary and that its function could be performed better by the Committee on Public Relations. At that time I demurred but believe now that Dr. Smith was right. The Committee on Medical Economics is not and cannot be in sufficiently close touch with the Secretary and the Committee on Public Relations to co-operate successfully. If it is not going to hurt someone's feelings I recommend that the Committee on Medical Economics be discontinued.

In a few instances during the past year I have been distressed by the medical testimony in tort cases because it has been palpably inaccurate. A few years ago a doctor from a neighboring state came to New Hampshire to give inaccurate testimony of this sort. I reported the matter to the Committee on Ethics of the medical society in this neighboring state and this committee issued the following decision about the offending doctor: "His testimony is unethical, unprofessional, prejudiced and discourteous, and does not state facts as they are. It is an attempt of one trying to give expert testimony who is not qualified to do so, and it must appear that it was given simply for a fee, rather than from a sense of duty, against one of our profession in trouble. These words are harsh but the offending doctor has not again given testimony against one of his fellow practitioners."

I do not know whether we ought to have a Committee on Ethics in New Hampshire, but I do believe that a hard-boiled critic would increase the accuracy of some of the medical testimony that is heard in court.

Meanwhile, the attempted socialization of medicine goes on apace. Verily, we are headed for the government ownership of medicine in a hick.

CARLETON R. METCALF

SPEAKER ROBINSON: Dr. Messinger, are you ready with your report on the Secretary-Treasurer's report?

DR. MESSINGER: The Committee on Officers' Reports wishes to thank the various officers and chairmen of committees for the promptness of their reports, and the concise manner of their presentations.

We recommend the acceptance of these reports and their incorporation in the transactions of this society.

I move that that portion of the report of the Committee on Officers' Reports be accepted.

This motion was seconded and was carried.

DR MESSINGER This Committee recommends that Frank J Sulloway be sent a check for one hundred dollars each year, until further notice I so move

This motion was seconded and was carried

DR MESSINGER The Committee on Officers' Reports recommends that the Committee on Mental and Social Hygiene be asked to study the methods of procedure for sterilization of the mentally deficient persons with simplification of the procedure in mind A consultation with Frank J Sulloway on the legal aspects of this procedure would be well worth while

In view of the present medical and economic unrest, the committee recommends the continuance of the Committee on Medical Economics

I move that this portion of the Committee on Officers' Reports be accepted

This motion was seconded and was carried

DR MESSINGER This Committee believes that no Committee on Ethics is necessary, but that unethical practices should be brought to the attention of councilors

DR D G SMITH I move that that portion of the Committee on Officers' Reports be accepted

This motion was seconded and was carried

SPEAKER ROBINSON The next order of business is the councilor's report for Sullivan County

Councilor's Report for Sullivan County

The Sullivan County Medical Society has enjoyed its usual healthy condition during the past year The membership for 1937 was 100 per cent and the interest enthusiastic

The annual meeting, which was held in Claremont on November 18, was the only meeting during the year However, this was unusual in scope as it took place on the same day as the annual round up of the Claremont Diagnostic Cancer Clinic and at the morning session we had a review of many of the cases seen during the year

Pathologists from the State Laboratory were present to do frozen sections on biopsies taken from suspicious cases, thus correlating the clinical examination with the pathological findings We were favored by the presence of Samuel T Ladd, of Portsmouth, president of the New Hampshire Medical Society

Luncheon was served at the Claremont Hospital The afternoon program consisted of a very interesting talk on brain surgery by Elliott C Cutler, chief surgeon of the Peter Bent Brigham Hospital, of Boston

Immediately after the scientific paper, there was an informal debate on medical economics, built around the activities of the 'Committee of 430, between Dr Cutler on the one side and President Ladd on the other This was hot. Possibly the real issues which made the

discussion a draw were 6 00 p m. and a telegram from Boston for Dr Cutler to hurry back to a case. At any rate, I think the decision of the Sullivan County Medical Society is that we are not quite ready for state medicine.

There were a large number of visiting doctors present from outside the county, including some from Massachusetts and Vermont. We all had a wonderful day and are deeply indebted to Dr Cutler, Dr Ladd and Dr. Kingsford for their share in the program

EMERY M FITCH, *Councilor*

SPEAKER ROBINSON The report will be turned over to the Committee on Officers' Reports for its consideration Are there any other councilors' reports that anyone has at this time? If not, we will go on to the reports of standing committees

Report of Committee on Control of Cancer

The chief activity of your committee during the past year has been the preparation and distribution of three letters to the medical profession in New Hampshire. These letters describe briefly important phases of some aspects of cancer control

The first one, issued in December, 1937, was entitled 'Cancer of the Uterus' The second one, issued in February, 1938, covered the subject of 'The Proper Handling of Biopsies,' and the third one, issued in March, 1938, suggested methods by which the presence of cancer could be detected during routine physical examinations

The committee feels that these rules laid down to guide the physician in the examination of a patient for the detection of possible cancer are extremely important

At the request of physicians interested in cancer education, the committee has sent copies of present and past letters, together with the handbook *The Early Signs and Symptoms of Cancer* to New York, Georgia, Connecticut and Vermont.

The committee stands ready at all times to co-operate with the New Hampshire Cancer Commission, with its cancer clinics, and with the hospitals of the State and with the American Society for the Control of Cancer The activities of the Women's Field Army, sponsored by the American Society for the Control of Cancer, receive our heartiest support.

New Hampshire was chosen as the first state to be organized early in 1937, and this year there are forty-five states actively engaged in this campaign for membership during the month of April Last year many members of the New Hampshire Medical Society assisted this activity by speaking on cancer to seventy three groups in the State.

Cancer is our second cause of death in the country, and New Hampshire has the highest cancer mortality rate in the United States Every physician should feel his responsibility toward controlling this disease by educating his friends and patients in the knowledge that cancer is a curable disease, but that its curability depends upon early recognition and early treatment.

By means of talks given by physicians, by a changed attitude of the public in its relation to the discussion of cancer, and by the distribution of large amounts of informative literature to most of the homes in the State, the citizens of the State are acquiring a much needed education regarding cancer and its control

It behooves every physician to keep himself well informed of the fundamental principles of cancer diagnosis in order that he may detect the signs that might indicate

the presence of cancer. It should always be borne in mind that the fate of the cancer patient rests with the physician who is first consulted.

From information obtained from the personnel of the State Cancer Clinics, there still appears to be an unfortunate lack of appreciation on the part of some physicians of the serious implication of certain sores in the mouth, rectal bleeding, hematuria, and flowing between periods and after the menopause.

Your committee has expended, due to the increased mailing costs demanded by the larger membership, the entire amount appropriated for its use. We ask for an appropriation of sixty dollars for the ensuing year.

GEORGE C. WILKINS, *Chairman*
HOWARD N. KINGSFORD,
GEORGE F. DWINELL, *Secretary*

SPEAKER ROBINSON: This report has already been considered by the Committee on Officers' Reports.

DR. MESSINGER: The Committee on Officers' Reports heartily approves of the pamphlets distributed.

We recommend the appropriation of sixty dollars for this committee's work.

I move that this portion of the report be accepted.

This motion was seconded and was carried.

Report of Committee on Medical Economics

In regard to an unofficial fee schedule for workmen's compensation cases, your committee has made an investigation as asked by the House of Delegates. It finds that there seems to be a varying amount of interest in such schedules by insurance companies. Some companies say that they manage satisfactorily without such lists; others believe they would find them of value as an indication to the physician of a reasonable charge for his services.

In respect to hospitalization insurance, the House will recall that three years ago this matter was placed in the hands of the Hospital Superintendents' Club. It is learned from this group that the subject is of real interest to that body and that it would like to see such a system set up.

The rural nature of this state, the lack of many large industrial centers, the great amount of present and past unemployment, the differences found in various districts, all make it extremely difficult to find a system which would fit the entire state, while small regions present the difficulty of possessing groups too small to be suitable for such insurance with financial safety in cases of epidemic or widespread sickness. The possibility of joining an already existing group for such insurance in another state and that of taking out such insurance in a commercial company — and these are rapidly coming into being — may prove more practicable in achieving hospitalization insurance.

Shall the Committee on Medical Economics be continued? This is a matter naturally for the House of Delegates to settle. It might not be amiss for this committee to make some comments on the subject, after three years of existence. The large questions concerning socialization of medicine the committee has not officially considered. This is due in part to the magnitude and difficulties of this fundamental subject, and a hesitation to embark upon this line when differences throughout the country

among members of our own profession are so profound and involve so much heat, and in part to the field to be covered by this committee.

The question of jurisdiction was brought up at the time this committee was created and was never settled by the House. It is a logical assumption that this task should belong to the Committee on Public Relations. Among its membership of five, it includes the three outstanding elected officers of the Society — the President, the Vice-President and the Secretary-Treasurer, as ex-officio members. It might well seem that to that committee would belong a question of so much importance to this society, rather than to the Committee on Medical Economics. If so, there would seem to be little reason for continuing the latter committee longer.

Another solution would be to make the Committee on Medical Economics an adjunct to the Committee on Public Relations, and the latter might call upon the former for special study and advice, if and when desired.

If the Committee on Medical Economics is to be continued, it would seem advisable that the field of this committee should be more definitely stated. I might add that the members of this present committee are not in agreement in this respect.

TIMOTHY F. ROCK,
LESLIE K. SYCAMORE,
FREDERIC P. LORD, *Chairman*

Report of Committee on Medical Education and Hospitals

The activities of this committee during the past year have been concerned with the continuation of the program of the Commonwealth Fund relative to postgraduate studies, with further increase in the Speakers' Bureau, and with consideration of the question of the necessity or desirability of promoting a basic science law in this state.

Commonwealth Fund Fellowships. The purpose of the Commonwealth Fund fellowships has been explained in previous reports. The same offer is continued this year by the Commonwealth Fund, and on January 31, 1938, an announcement was sent out to the members of the Society along with a letter from Dr. Ladd, our president. To date we have received eighteen requests for application forms, which are filled out by the applicant himself and mailed by him to the office of the Commonwealth Fund in New York City. At this time last year there were twenty-two requests for applications.

We have discussed with the officials of the Commonwealth Fund the fact that the percentage eligible in this state is rendered too low by virtue of their primary requirements, which are (1) that the applicant be established in practice in his locality for not less than five years, (2) that he be not over forty years of age, (3) that he be in practice in a community of less than 10,000 population. As we have reported before, the percentage of men in this state who could qualify is very small.

The fellowship awards made in 1937 were as follows:

Phillips, Arthur F., Bristol — Medicine
Turley, Raymond J., Meredith — Medicine
Jacques, Laura G., Tilton — Medicine
Eastman, Cyrus D., Monroe — Medicine
Hazen, Harris B., Lebanon — Medicine
Huse, Ernest L., Meriden — Medicine
Reische, Merrill G., Meredith — Medicine
Copenhaver, Leslie B., North Woodstock — Medicine
Churchill, Kenneth, Lebanon — Medicine

Doyle, Peter J., Dover — Obstetrics
 Eckels, John C., Lisbon — Obstetrics
 Levine, Harold D., Bristol — Obstetrics
 Beattie, Barbara, Littleton — Pediatrics
 Johnston, Albert C., Gorham — Roentgenology
 (3 months)

It is interesting to note that during the past year there has been increased activity on the part of the Federal Government in the field of postgraduate medical instruction. Possibly an offspring of the same movement is the appointment of a full time man by the American Medical Association to co-operate, in an advisory capacity, with the state societies relative to the program of graduate instruction.

Speakers' Bureau At the time of the circularizing of the membership of the Society in January, in connection with the Commonwealth Fund fellowships, requests were included for amplification of the listing of the Speakers' Bureau. Fourteen names were added at this time, and the list has been placed in the hands of the secretary of each county society. It is difficult to obtain information as to how extensively this listing is used in obtaining speakers for county meetings.

The Basic Science Law At the meeting of the House of Delegates in May, 1937, it was voted to ask the Committee on Education and Hospitals to consider the necessity and desirability of promoting a basic science law in this state, and to report on this matter at the annual meeting of the House of Delegates in 1938.

For information and material on this question, your committee has contacted the American Medical Association and the Minnesota State Board of Medical Examiners. The latter state has been one of the pioneers in the field of the basic science law.

In general the basic science law has been adopted as a public-health measure aimed at the elimination of the poorly trained and equipped individual of whatever school of practice. Its administration is under the control of a separate board which conducts examinations in the basic medical sciences, and whose certification is necessary for eligibility for examination for a license to practice.

It has, therefore, resulted in the existence of two state boards and of two fees to be paid by the applicant. This has resulted in some difficulty and some ill feeling in the field of interstate reciprocity, because the only exemption from the Basic Science Board examinations, where non-existent in the other state, is provided by the certificate as a diplomate of the National Board.

A further difficulty lies in the fact that with the introduction of a Basic Science Board, there has resulted usually a board of mixed membership consisting of medical men, representatives of osteopaths, chiropractors, and so forth.

It is the feeling of your committee that the question is not subject to definite recommendation at this time and that it be considered further by this Committee in co-operation with the Committee on Public Relations and the State Board of Medical Examiners.

It is our belief at this time that the introduction of the basic science law in New Hampshire would add little to the control by the State Board of Medical Examiners and that it would probably lead to more difficulty than it would alleviate.

In connection with this study, it has been made rather apparent that one of the real needs of the State of New Hampshire is an annual registration law which would

considerably reinforce the controlling powers of the State Board of Medical Examiners.

JOHN P. BOWLER, *Chairman*,
 JAMES W. JAMESON,
 HARRIS E. POWERS

DR. MESSINGER The Committee on Officers' Reports is glad to note the increasing number of men taking advantage of the Commonwealth Fund fellowships.

We note that the Speakers' Bureau list has been revised, and we hope that the county societies will make more use of it.

We agree with the opinion that the basic science law is not feasible for this society at the present time and that it be held for further consideration.

This Committee recommends that the Committee on Medical Education and Hospitals confer with the State Board, concerning the annual registration of physicians, with the passage of such a law in view.

DR. MESSINGER I move the adoption of this portion of the report.

This motion was seconded.

DR. WALCK What would be the fee for the annual registration?

SPEAKER ROBINSON It would be two dollars, I believe.

DR. DUBE Why does the Board need to have more accurate knowledge of who is practicing by registration? Of what benefit is it going to be to them?

DR. D. G. SMITH I think it would be valuable to know whether doctors are located in the State, thereby bringing the mailing list up to date.

SECRETARY METCALF Is this annual registration vital enough to pay for the bother and expense of it?

DR. DUBE Does not the Board have a record of all the licensed physicians and of all the licenses granted, whether by reciprocity or examination?

DR. D. G. SMITH Yes.

SPEAKER ROBINSON The question is still open for discussion. The motion before the House is on the adoption of this part of the report of the Committee on Officers' Reports. Are you ready for the question?

There was an overwhelming "no" vote, and the motion was lost.

DR. MESSINGER Then I move that the first three paragraphs of our report be accepted

This motion was seconded and was carried

Report of Committee on Maternity and Infancy

During the year that has elapsed since the last meeting of the Society, this committee has held seven meetings. At these meetings we have made a study of all the information which the committee has been able to obtain on each individual maternal death. The material used consisted of a copy of the death certificate, answers to questionnaires sent to physicians and in many cases information obtained by the State Board of Health and by contacting the physicians in charge of the cases and wherever possible, by checking the hospital records.

In all cases the patient has been known to the committee only by number, the committee not knowing the location, the hospital or the physician in charge.

In 1930, the infant mortality was 61 per 1000 live births. In 1936 it was 47. In 1930, twenty three states had a higher infant mortality than New Hampshire and 26 had a lower. In 1936, thirty nine states had a higher infant mortality, seven lower and three the same. In 1936, the infant mortality rates ranged from 115 in New Mexico to 42 in Connecticut, New Hampshire was in the upper ten for low infant mortality.

In 1930, maternal mortality per 1000 live births was 6.2, in 1935 it was 6.1, and in 1936, 4.8. In 1930, twenty six states had a higher maternal mortality than New Hampshire, and in 1935 there were nineteen states.

The number of maternal deaths in 1935 was 46. In 1937 it was 32.

The neonatal mortality (deaths under two weeks) in 1930 was 37.3 per 1000 live births, and in 1935 it was 35.3.

In the causes of maternal death in 1937, the greatest number were due to (1) toxemia of pregnancy, (2) embolism, and (3) postpartum hemorrhage.

A study of stillbirths, which was made almost entirely from death certificates and answers to a questionnaire, showed that there were 181 stillbirths reported. Questionnaires were sent to 181 and answers were received from all but 14. The leading causes of death in this list were (1) deformity, (2) prematurity, (3) asphyxia, and (4) toxemia of pregnancy.

During the last session of the Legislature, at the recommendation of the committee, the Medical Practice Act was amended to require "an internship of not less than twelve months." We have an agreement with the Board of Registration in Medicine that in the case of all physicians who may practice obstetrics the internship must include a reasonable amount of obstetric training.

Under the Social Security Act, much larger appropriations have been made available for maternity and infancy work. There has recently been proposed by Dr Underwood, of Mississippi, an amendment to Title 5, Part I, of the Social Security Act to provide additional sums to carry out maternity and infancy work—during the year of 1939, \$3,000,000. 1940, \$8,000,000, 1941, \$12,000,000, 1942, \$16,000,000, 1943, \$20,000,000.

At the meeting of the committee held on March 23, 1938, it made the following recommendation which was transmitted to the State Board of Health:

That it is the opinion of the committee that as large appropriations as apparently contemplated will tend to unbalance plans of county and state departments of health by overemphasizing a single phase of public-

health work and that the use of such large appropriations to be allocated by a federal bureau will tend to produce public sentiment in favor of state-controlled medical practice.

There has been much improvement in the living in hospitals and homes, especially the latter, since our last report. Following the transfer, as recommended by your committee of the licensing of obstetric departments of hospitals and maternity homes to the Department of Health, definite requirements were drawn up as minimum standards required for licensing, and several places that did not meet the requirements from the point of view of medical care or fire hazard have been eliminated.

Statistics show that each year more than 14,000 women in the United States die from causes connected with childbirth, leaving at least 35,000 children motherless, that more than 75,000 infants are stillborn and that about 69,000 die during the first month of life.

In addition to this list of deaths, morbidity, both immediate and more or less permanent, claims an uncouneted number of mothers. During the last twenty two years, statistics show that there has been little reduction in maternal mortality. However, the death rate from toxemia has tended to decline. The mortality rate from septicemias and hemorrhage shows very little reduction.

In studying the maternal deaths this year, the committee has attempted to divide them into three groups, first, those in which the patient was at fault, secondly, those in which more efficient medical treatment was needed, thirdly, unavoidable deaths.

The committee wishes again to call your attention to previous recommendation that obstetric cases be cared for in separate departments and delivered in rooms used only for that purpose and that special rooms be provided for the isolation of all infected cases. That caps, masks and sterile gloves and gowns be worn at all deliveries and that, in the case of hospitals, special apparatus for resuscitation and combating hemorrhage be available, that the ammoniated-mercury treatment, previously recommended by this committee, or other preventive treatment be used to prevent impetigo, that cesarean sections be elective only and preferably that consultations be held on all cases before operation, that high and midforceps be eliminated so far as possible and that forceps be used only on cases when the head is on the perineum. Vaginal examinations during delivery should be replaced by rectal examinations.

We note in studying the histories of 32 cases this year that autopsies were performed on only 5 and that these cases were not obscure.

In conclusion, the committee wishes to recommend the taking of Wassermann tests on all mothers as soon as they come under treatment. Because of the inaccuracy of cord Wassermann tests done on blood from the cord, it believes that such tests should be discontinued.

We believe that it is possible to reduce materially the number of maternal deaths in New Hampshire, especially in the two largest groups—toxemias and surgical obstetrics.

We further believe that obstetrics is sufficiently important so that men who are not qualified, either by training, undergraduate or postgraduate, or who are not equipped to handle obstetrical emergencies, either themselves or with a consultant near at hand, should refer such cases to a trained obstetrician.

ROBERT O. BLOOD
BENJAMIN P. BURPEE
CHESTER F. MCGILL

DR MESSINGER We commend the meticulous work of this committee. We agree that maternal mortality should be reduced, if possible, and that the proper method of so doing is to give publicity among physicians.

I move the adoption of the report.

This motion was seconded and was carried.

Report of Committee on Mental and Social Diseases

No elaboration of the mental hygiene program for the State has been made in the past year, chiefly due to the lack of funds. The State Hospital still maintains outpatient clinics in Manchester, Nashua and Concord.

The Laconia State School has completed a well-designed hospital building for the care of its helpless and more or less crippled children.

The House of Delegates last year passed a resolution referring to this committee the matter of improving the commitment laws of this state. Your committee believes the present commitment laws are very satisfactory, with one exception, provided the requirements of the law are fully carried out. The exception is that the act passed in 1935, relative to commitment to the State Hospital, does not give the power of commitment to county commissioners, and there is no reason why they should not have the same power as selectmen.

In the field of social hygiene the State Board of Health and United States Public Health Service have won a good fight passing the law requiring blood tests on those contemplating marriage.

The control of venereal disease is carried on by the State Board of Health, as in the past, by lectures and the distribution of literature, free to the public, and through treatment rendered by clinics maintained by the Board in five cities of the State,—Berlin, Dover, Concord, Manchester and Nashua,—where free treatment may be secured.

Through federal aid, free drugs for the treatment of syphilis are furnished to all physicians asking for them and reporting cases as required by the State Board of Health.

Through the better co-operation of the physicians, a great improvement has been noted in the reporting of cases by physicians of the State during the past year.

CHARLES H. DOLLOFF
BENJAMIN W. BAKER,
CHARLES A. WEAVER

DR MESSINGER The Committee on Officers' Reports approves the recommendation that county commissioners be allowed the same power of commitment as selectmen, and that this matter be referred to the Committee on Public Relations.

I move the adoption of the report.

This motion was seconded and was carried.

Report of Committee on Tuberculosis

The past and present of the tuberculosis control program in our state and nation is known to you.

Since the beginning of the century, tuberculosis has

declined from the leading cause of death to the sixth place in the nation and to the seventh in New Hampshire. This remarkable result has been brought about through the united efforts of the people and the medical profession.

What is to be the future of the tuberculosis control program in our state and nation? Has the phenomenal reduction in the death rate reached its irreducible minimum? Will the medical profession and the people of the State continue their active interest and support of the campaign against tuberculosis?

Let us answer the last question first. As to the medical profession, the answer is apparent in the organization of tuberculosis committees by many medical societies (in the New Hampshire Medical Society since 1914), the increasing number of professional studies, the increasing activity of the profession in examining contacts, the more frequent use of the chest x ray for diagnosis and in securing necessary clinical and sanatorium facilities.

As to the people, the answer is also clearly apparent in their increasing grasp of the fundamentals of the known knowledge of the means of transmission, of prevention and of cure of the disease, their ready participation in activities for discovery of the disease (98 per cent of the children in a recent high school tuberculin test demonstration securing consents of parents for the tests), increasing willingness of patients to enter the sanatoriums, the increasing financial support given by the people to the sanatoriums for additional beds and to tuberculosis associations to expand their educational and case finding services. The profession and the public want more good tuberculosis work, more early diagnosis, more prevention, more cures and further reductions in tuberculosis death rates.

Since 1920 the tuberculosis death rate in New Hampshire has been reduced from 97 to 33 per 100,000 population. Have we reached the irreducible minimum? There was no reduction in the death rate in 1935. In 1936 there was an increase of 2 deaths over the total for the preceding year.

However, we do not believe that we have reached the irreducible minimum in the tuberculosis death rate in New Hampshire. With more and more of the 'spreaders' of the disease being constantly searched out, the foci of infection are being controlled, and consequently, decreasing numbers of people are becoming infected. With increasing effectiveness of sanatorium treatment, more patients are being cured. Through the prompt examination of contacts by means of the tuberculin test and chest x rays of positive reactors, we can detect early manifestations of the disease and bring about a cure, thus preventing future 'spreaders'. We can look forward with confidence to halving the present tuberculosis death rate within the next ten years.

Through the assistance of the New Hampshire Medical Society there has been an increase in the number of sanatorium beds. The long waiting lists of the past have been absorbed.

The use of chest surgery at the two sanatoriums is increasing with encouraging results. Last year your committee offered to assist in the interpretation of chest films. The service has developed into a sizable responsibility, and several hundreds of films have been forwarded for interpretations during the past year. Again, your committee would urge still greater use of the x ray of the chest, particularly for persons complaining of lassitude, loss of weight or hemorrhage. Many will show marked but curable tuberculosis, which on physical examination will present little or no evidence of the disease.

X rays of the chest should be taken particularly in young

adults, for the disease is most prevalent in the twenty to twenty nine year-old age group. This is already being done in the colleges and universities. However, the incidence of tuberculosis is relatively low in the college and professional groups but high among unskilled workers.

The New Hampshire Tuberculosis Association has been aided materially in its chest diagnostic service for this class of people through the participation of the hospitals of the State in providing x-rays of the chest for clinic cases at a nominal fee.

Your committee suggests that when members of the Society send in chest films to the New Hampshire State Sanatorium or to the New Hampshire Tuberculosis Association for interpretation that they enclose a brief history of the case.

May we also urge upon the members of the New Hampshire Medical Society the vital importance of repeated sputum examinations for tubercle bacilli. It is only too true that physicians and patients are sometimes lulled into a sense of false security, patients are told that they have no tuberculosis following only one sputum examination which happens to be negative.

Just at the present time the State Tuberculosis Association, in collaboration with Dr. A. L. Winograd, of Nashua, is carrying out a study relative to the reliability of the Lederle patch test—tuberculin on adhesive tape applied to bare skin—as compared with the purified protein derivative tuberculin test, intracutaneous. Already 878 children have been given both tests simultaneously. It is planned to carry on the study to a total of approximately 2000 children this spring. If the Lederle patch test proves to be as reliable as the intracutaneous test (Mantoux) it offers an effective means in private practice of sifting out those persons with tuberculous infection easily and economically, for as few as one patch test may be purchased at a time.

ROBERT B. KERR
ROBERT M. DENING
JOHN D. SPRING

DR. MESSINGER. The Committee on Officers' Reports wishes to commend the Committee on Tuberculosis for its continued fine work to reduce the death rate from tuberculosis.

The service extended gratuitously by the committee to general practitioners for reading x-ray films is an excellent service.

If the study being made at the present time of the Lederle patch test proves reliable, we hope that the committee will publish its results so that all members of the Society may become acquainted with them.

I move the adoption of that portion of the report.

This motion was seconded and was carried.

Report of Committee on Child Health

The committee has little new to report for the past year. We would again recommend a series of lecture courses in pediatrics, under the joint auspices of the Society and the State Board of Health, comparable to the series in obstetrics recently held.

We again favor having free diphtheria toxoid and small pox vaccine available to doctors for use in needy cases. This should encourage such immunizations in doctors' offices and reduce the necessity for free clinics.

There has recently come to our attention a brief summary of immunization procedures which we hope can be distributed to the members of the Society. Recent significant changes in preferred methods make such a pamphlet of considerable value.

The committee is interested in the problems of determining the number of crippled children in the State. The Board of Health needs this information in connection with plans to aid needy members of this group. When it can be determined exactly what the term "crippled child" includes, for the purposes of this work, the aid of the members of the Society may be requested to complete a register of such children. The committee feels that the Board of Health should have the full co-operation of the Society in this matter.

TRAVIS P. BURROUGHS,
FRANKLIN ROGERS,
COLIN C. STEWART, JR., *Chairman*

DR. MESSINGER. The Committee on Officers' Reports agrees with the report of the Committee on Child Health that more education in this field is needed. However, we do not believe that the physicians would attend a series of lectures. If each county society would have one lecture by some outstanding pediatrician, more physicians would attend.

We now move the appropriation of fifty dollars for pamphlets to be sent to all physicians regarding immunization procedures.

This motion was seconded and was carried.

Report of Delegate to the American Medical Association

The Atlantic City session of 1937 was even better and more largely attended than the 1935 session. Nearly ten thousand doctors were present, and the papers and exhibits were of the very best.

The House of Delegates had several extra sessions and many resolutions were adopted. Your delegate again served on the Reference Committee on Credentials. It is of interest to note the increased attendance of the New Hampshire doctors, twenty-two registering in 1937, as compared with eight in 1935.

There was created a Distinguished Service Award which provides for fitting recognition to fellows rendering distinguished service in the science and art of medicine. Contract practice was more fully defined and a Council on Industrial Health was established. It was recommended to the Social Security Board that examinations for blindness be carried out only by doctors of medicine who are competent to diagnose and treat diseases of the eye. The Council on Medical Education and Hospitals was urged to find some way to make more extended inspection of hospitals.

A resolution was passed requesting the school authorities to put the family physician's name on each child's index card, and that the physician and also the parents be informed of any accident or illness occurring in the school. It was recommended that this action be brought

to the attention of the secretaries of the state and county medical societies

To aid in the attempt to reduce automobile accidents, it was urged that the legislative committee of the various state societies work for a standard drivers license law, as advocated by the National Safety Council and approved by the American Medical Association. States having this law have reduced their vehicle death rates an average of 20 per cent, while all other states have increased their death rates

The report of the Committee on Contraception was unanimously adopted. The Association was asked to make clear to physicians their legal rights in relation to the use of contraceptives, to investigate and report on the various materials, devices and methods used in contraception, and to promote thorough instruction in medical schools with respect to both fertility and sterility. It was recommended that information and advice concerning contraception should be given only in clinics and similar establishments legally licensed to treat the sick and under medical control.

The federalization of the practice of medicine and the care of the indigent sick was discussed at length. Following the publication of the American Foundation reports, a group of physicians were said to have drafted recommendations for the development of a national health policy, the expansion of preventive medicine, federal subsidization of medical schools and hospitals, and the establishment of a federal department of health. The Medical Society of the State of New York adopted the recommendations after modifying them slightly and adding that all plans should be approved by the local medical profession before they were put into effect in any community. This society brought the matter before the House of Delegates which, after several long hearings, voted that it approves a federal health department, that it recognizes the primary importance of public health, and that the American Medical Association continue its "studies of the need for and the methods of distributing medical care, to the end that the American Medical Association shall continue to do everything possible to promote and to protect the health of the American people." It added

"The American Medical Association reaffirms its willingness on receipt of direct request to co-operate with any governmental or other qualified agency and to make available the information, observations and results of investigation together with any facilities of the Association."

Senator James Hamilton Lewis, of Illinois, asked to address the House of Delegates and his request was granted. He said there was a proposal to attempt to federalize the practice of medicine by licensing physicians who care for the indigent. He said that he brought the following message from the President of the United States "He hoped that you would find a way to co-operate with him in such methods as you would jointly find would be to the service of the helpless and the afflicted within such province as you felt government should undertake." The Board of Trustees was authorized to send a suitable reply to the President.

Since the annual session of the American Medical Association, there has been published a set of "Principles and Proposals" in the provision of medical care, apparently identical with those proposed by the physicians who made the recommendations that were discussed by the Medical Society of the State of New York and the American Medical Association. These proposals, endorsed by 430 physicians, have received considerable publicity, and it is probable that they will be again discussed in the approaching session of the American Medical Association.

Your delegate would like to be definitely instructed

as to what position he shall take in respect to these proposals, especially those relating to the federal subsidization of medical schools and hospitals

DEERING G SMITH

DR MESSINGER The Committee on Officers' Reports wishes to commend our delegate to the American Medical Association for his careful and accurate report. We move that this report be accepted and incorporated in the minutes of this meeting

This motion was seconded and was carried

DR. MESSINGER I move that this Society pass a resolution opposing the federal subsidy of medical schools and hospitals, and that our representative to the American Medical Association meeting be empowered to express our opinion on this matter

We also recommend that the Committee on Memorials and Communications draft a resolution expressing the disapproval of this society of federal subsidy of medical schools and hospitals

This motion was seconded and was carried

DR WALCK I have a list of members in Strafford County, who were voted by the Society to affiliate membership. We request that they be voted in as affiliate members of the New Hampshire Medical Society. The names are J H Bates, of East Rochester, R G Blanchard, of Dover, L W Flanders, of Dover, F L Keyes, of Rochester, M A H Hart, of Milton

DR. D G SMITH The Hillsborough County Medical Society has elected to honorary membership E B Sweet. The County Society has asked this House of Delegates to make him an affiliate member of the New Hampshire Medical Society

DR. HUBBARD We have two members of the Cheshire County Medical Society, H A Faulkner, of Keene, and Dennis Lamb, of Keene, whom we should like to recommend as affiliate members

DR SYCAMORE On behalf of the Grafton County Medical Society, I wish to present the names of F A Bogardus, of Canaan, J W Bowler, of Hanover, and G D Frost, of Hanover

DR DYE I move that the Secretary be instructed to cast one ballot, electing these men to affiliate membership in the New Hampshire Medical Society

This motion was seconded and was carried

SPEAKER ROBINSON The Secretary has cast a ballot in favor of all of them and I declare them duly elected to affiliate membership

DR D G SMITH My attention was called, a

short time ago, to a resolution passed by this society in 1932, relating to a proposal to have a federal hospital in this state. It seemed that at that time, all ex-service men could be well taken care of in the existing hospitals in the State, and that, if necessary and if thought best, the Federal Government could pay for their care just as well and probably a great deal more cheaply in the local hospitals

Therefore, in 1932, the House of Delegates passed the following resolution

We protest against the multiplication of hospitals designed largely for the care and treatment of ex service men suffering from diseases contracted since their discharge from the service, and we recommend that the facilities offered by existing civilian hospitals be more largely utilized. We further recommend that copies of this resolution be sent to our representatives in Congress

I move that this present House of Delegates reaffirm this resolution, and that copies of it be sent to our representatives in Congress

This motion was seconded and was carried

SPEAKER ROBINSON Is there any other new business to come before the meeting at this time? If not, the Chair awaits a motion to adjourn

DR. DYE Mr Speaker, I move that we adjourn this meeting of the House of Delegates, to reconvene at eight-thirty o'clock tomorrow morning

This motion was seconded, and was carried

SPEAKER ROBINSON I now declare this meeting adjourned

Whereupon, the Monday Evening Session of the House of Delegates was adjourned at ten-forty o'clock in the evening, to reconvene at eight-thirty o'clock on Tuesday morning, May 17, 1938

* * *

The House of Delegates convened at the Hotel Carpenter, Manchester, on Tuesday morning, May 17, 1938, at eight-thirty o'clock, with Speaker Richard W Robinson, of Laconia, presiding

The following members answered the roll call

The President, ex-officio
The Vice-President, ex-officio
The Secretary-Treasurer, ex-officio
Chester L. Smart, Laconia
A Philip LaFrance, Laconia
William J Paul Dye, Wolfeboro
Francis J C Dube, Center Ossipee
Osmon H Hubbard, Keene
Norris H Robertson, Keene

William M Bronson, Lancaster
Robert M Deming, Glenduff
Leslie K. Sycamore, Hanover
John C Eckels, Lisbon
Deering G Smith, Nashua
Clarence E Dunbar, Manchester
George V Fiske, Manchester
Herbert B Messinger, Franklin
Henry C Sanders, Claremont
Edna Walck, Dover
Addison Roe, Newport
Emery M Fitch, Claremont
Henry O Smith, Hudson

SPEAKER ROBINSON We will hear the report of the Committee on Memorials and Communications

DR W J PAUL DYE Concerning hospitalization insurance, your committee recommends that this question be referred to the Committee on Public Relations for further study and for detailed recommendations to be later submitted to the House of Delegates

DR LADD I move that this recommendation be adopted

This motion was seconded

SPEAKER ROBINSON This matter is now open for discussion

SECRETARY METCALF The Committee on Public Relations would be glad to have your opinion as to what should be done in the event that the Hospital Superintendents' Club wishes to put this plan into effect before the House of Delegates meets again

DR. FISKE May I ask what the attitude of the American Medical Association is toward this matter?

SPEAKER ROBINSON They favor it.

DR. LORD I think it would be well to put ourselves on record as being in favor of it

SPEAKER ROBINSON Would you like to amend the motion before the House to that degree? That would give us an expression of opinion of the House of Delegates

DR LORD Yes, that we approve the principle of insurance

SPEAKER ROBINSON Dr Lord has moved to amend the motion before the House that it go on record as approving the principle of hospital insurance, and that the Committee on Public Relations, in co-operation with the Hospital Superintendents' Club, be empowered to act for the House

of Delegates with any plan that they mutually agree upon as being most advantageous in carrying out the principle of insurance

The amendment was seconded and was carried

SPEAKER ROBINSON Now, the question is on the original motion of the report of the Committee on Memorials and Communications Those in favor of accepting the report will signify by saying "aye"

The motion was carried

DR DYE Your committee proposes the following resolution

WHEREAS, by the death of Dr Charles Duncan, secretary of the State Board of Health, the New Hampshire Medical Society has lost a member who has served his state long and faithfully in the interests of medicine, therefore be it

RESOLVED, That the New Hampshire Medical Society appreciates, in the death of Dr Charles Duncan, the loss to the State of a competent and sincere official, and the loss to the many who worked with him of an earnest and true friend He worked steadily for the progress of public health Following his graduation from Harvard Medical School in 1903, he became bacteriologist for the New Hampshire Board of Health, acting as bacteriologist and pathologist for the State Hospital, the Margaret Pillsbury Hospital and the New Hampshire Memorial Hospital. Dr Duncan became secretary of the State Board of Health in 1918, under his direction, the Laboratory of Hygiene was established, and the work of the department increased greatly in scope, in line with the significant advance in the field of preventive medicine. Through his long period of service he gave wholeheartedly of his time and energy, accomplishing much toward the prevention of disease and the prolongation of life in a state that benefited greatly thereby, and be it further

RESOLVED, That these words be incorporated in the records of the New Hampshire Medical Society, and that a copy be sent to Mrs Duncan as an expression of the sympathy and esteem held by the members of this Society

Your Committee recommends that the memorial communication concerning the death of Dr Charles Duncan be incorporated in full

SPEAKER ROBINSON You have heard the recommendation of the Committee on Memorials and Communications What is your pleasure?

DR SMART I move that the recommendation be adopted

This motion was seconded and was carried

DR DYE I have a summary of the Wagner Bill

Statement of Hon Robert F Wagner, United States Senator from New York, in the Senate of the United States, on April 11, 1938 Senate Resolution 265

It is proposed that there be established a select committee to be composed of three senators, no more than two of whom shall be members of the same political party,

to be appointed by the president of the Senate. The committee is authorized and directed to make a general study, investigation and analysis of the adequacy and cost of medical care in relation to income and ability to pay, and of ways and means to maintain and improve the health of the people of the United States, including but not limited to the following (1) expansion of federal aid, (2) extension of governmental aid, by co-operation of state and federal governments, (3) operation of existing public and private health insurance or group-health systems, (4) utilization of professional experts in the planning, direction and execution of the foregoing measures, (5) any other subject, matter or thing adjudged by the committee to be relevant or germane to the foregoing subjects of inquiry

The committee shall report to the Senate on or before February 1, 1939, the results of its study, together with its recommendations for appropriate legislation

Concerning Senator Robert F Wagner's resolution, your committee recommends that the House of Delegates go on record as favoring an unbiased investigation of national health problems We feel, however, that such an investigation was adequately covered recently by the American Medical Association, and this report is available for Senator Wagner's committee, furthermore, that this question be referred to the Committee on Public Relations, with power to act concerning such, according to developments in the future.

DR SYCAMORE I move the adoption of the report

This motion was seconded and was carried

DR DYE There are two senate and house bills pending for a new building for the Army Medical Library and Museum

Your committee recommends that the House of Delegates go on record as strongly endorsing the passing of S 3919 and H R 10455, bills proposing to authorize the construction of a new building for the Army Medical Library and Museum in Washington

DR SMART I move the adoption of the recommendation

This motion was seconded and was carried

DR DYE We recommend the adoption of the following resolution by the House of Delegates

WHEREAS certain proposals pertaining to the compulsory care of the indigent sick under federal control were mentioned by Senator James Hamilton Lewis at the June 10, 1937, meeting of the House of Delegates of the American Medical Association at Atlantic City, New Jersey, therefore, be it

RESOLVED, That the House of Delegates of the New Hampshire Medical Society go on record as unreservedly condemning the proposals presented by Senator Lewis relating to socialized medicine, that we purposely declare opposition to the enactment of any such plans by all

legitimate means at our disposal, and urge every New Hampshire physician to oppose this measure and to refuse to co-operate with any group or agency established to carry out Senator Lewis's outlined purposes, and be it further

RESOLVED That each county society in the State of New Hampshire be sent a copy of this resolution with the request of endorsing it, also that a copy be sent to New Hampshire representatives and senators in Congress

DR DUBE I move that the recommendation be adopted

This motion was seconded and was carried

SPEAKER ROBINSON Is there any other business to come before this meeting this morning? If not, a motion to adjourn is in order

DR DUBE I move that we adjourn until eight-thirty tomorrow morning, May 18, 1938

This motion was seconded and was carried

Whereupon, the meeting was adjourned at nine forty-five o'clock in the morning, to re-convene on May 18, 1938, at eight-thirty o'clock in the morning

* * *

The House of Delegates convened at the Hotel Carpenter, Manchester, on Wednesday morning, May 18, 1938, at eight-thirty o'clock, with Speaker Richard W Robinson, of Laconia, presiding

The following members answered the roll call

The President, ex-officio
The Vice-President, ex-officio
The Secretary-Treasurer, ex-officio
Herbert B Messinger, Franklin
William J Paul Dye, Wolfeboro
William M Bronson, Lancaster
Deering G Smith, Nashua
Henry O Smith, Hudson
Clarence E Dunbar, Manchester
Wendell P Clare, Portsmouth
Frederic P Lord, Hanover
A Philip LaFrance, Laconia
Francis J C Dube, Center Ossipee
Addison Roe, Newport

SPEAKER ROBINSON The first business of the meeting is the report of the Nominating Committee, by Dr Sanders

Report of Nominating Committee

OFFICERS

President Clarence O Coburn, Kenneth Churchill, George S Emerson.
Vice President James B Woodman, Richard E Wilder, Elmer M Miller
Councilors Clifton S Abbott, Belknap, Arthur W Burnham, Grafton.

Trustee Alpha H. Harriman, Emeritus, Samuel T Ladd

Speaker of the House of Delegates William J Paul Dye.

Vice-Speaker Fred Fernald.

Necrologist Henry H. Amsden.

Delegate (American Medical Association) Deering G Smith

Alternate Delegate Emery M. Fitch

Delegates (New England States Meetings)

Maine Wendell P Clare, Lawrence R Hazzard
Vermont Loren F Richards, John J Boardman.
Massachusetts William J Paul Dye, Arthur W Burnham.
Rhode Island Ellsworth M. Tracy, Benjamin E Sanborn
Connecticut Earl J Gage, Osmon H. Hubbard

COMMITTEES

Committee on Amendments to Constitution and By-laws

Fred E. Clow, Emery M Fitch, Louis W Flanders

Committee on Control of Cancer

George C Wilkins, Howard N Kingsford, George F Dwinell

Committee on Medical Economics

Timothy F Rock, 1939, Leslie K. Sycamore, 1940, Richard W Robinson, 1941

Committee on Medical Education and Hospitals

John P Bowler, James W Jameson, Harris E. Powers

Committee on Mental and Social Hygiene

Charles H Dolloff, Benjamin W Baker, Charles H Weaver

Committee on Public Relations

President, Vice President, and Secretary Treasurer, ex officio, Robert J Graves and John F Holmes

Committee on Publication

Carleton R. Metcalf, Warren H. Butterfield, Ellsworth M. Tracy

Committee on Scientific Work

Carleton R. Metcalf, Frederick P Scribner, Nathan T Milliken.

Committee on Tuberculosis

Robert B Kerr, Robert M Deming, John D Spring

Advisory Committee on Medical Relief

Robert J Graves, John P Bowler, Roland J Royce.

Committee on Child Health

Cohn C Stewart, Jr, Travis P Burroughs, Franklin N Rogers

Committee on Maternity and Infancy

Robert O Blood, Benjamin P Burpee, Chester F Magill

April 6, 1938 Luncheon meeting at which Dr Tracy Putnam, of the Boston City Hospital and the Department of Neurology, the Harvard Medical School, spoke of 'Modern Methods of Treatment for Diseases of the Nervous System.' This was an admirable review of medical and surgical advances in neurological treatment.

HENRY H. AMSDEN, *Councilor*

DR D G SMITH I move that this report be accepted

This motion was seconded and was carried

DR LADD I move that the Secretary be instructed to notify each and every Councilor that he shall make an effort to get his report to the House of Delegates next year without fail

This motion was seconded and was carried

SPEAKER ROBINSON The next business to come before the meeting is the determination of the place of the next meeting

DR DUNBAR I think the local members would be glad to invite the meeting to Manchester next year, as usual. If there are no other invitations I move that we hold our next annual meeting in Manchester

SPEAKER ROBINSON Does anyone wish to invite the Society elsewhere? Do I hear a second to the motion of Dr Dunbar?

This motion was seconded and was carried

SECRETARY METCALF I move that we express our gratitude to the Manchester medical group for the work which they have done this year and the courtesy they have shown in inviting us to come again

This motion was seconded and was carried

SPEAKER ROBINSON Is there any other new business to come before the meeting? If not, the Chair will entertain a motion to adjourn

DR LADD I move that we adjourn the 1938 meeting of the House of Delegates of the New Hampshire Medical Society

This motion was seconded and was carried

Whereupon, the 1938 meeting of the House of Delegates was adjourned at nine-thirty o'clock in the forenoon, on May 18 1938

SPEAKER ROBINSON You have heard the report of the Nominating Committee. The first order of business is the election of a president. The meeting is now open for any other nominations

DR. LADD I move that the nominations be closed

This motion was seconded and was carried

Ballots were then given to the delegates present

DR SANDERS Mr Speaker, there were thirteen ballots cast and Clarence O Coburn received thirteen votes

SPEAKER ROBINSON I declare Clarence O Coburn elected as president. The next order of business is the election of a vice-president. The meeting is now open to any further nominations

DR DYE I move that nominations be closed

This motion was seconded and was carried

Ballots were then given to the delegates

DR SANDERS The total number of votes cast was fourteen, James B Woodman received thirteen votes and Elmer M Miller received one vote

SPEAKER ROBINSON I declare James B Woodman elected as vice-president

DR LADD I move that the Secretary cast one ballot for the election of the rest of the slate, as presented by the Nominating Committee.

This motion was seconded

A vote by ballot was then taken, with reference to the rest of the officers

SPEAKER ROBINSON The ballot is unanimously "yes" Therefore, I declare the rest of the slate, as read by the Nominating Committee, elected

Dr Dye, chairman of the Committee on Memorials and Communications, has a further report to make

DR DYE We have this resolution to present

WHEREAS, We are in principle opposed to state medicine, inasmuch as we feel that such is not only detrimental to the best interests of patient and physician alike, but also that it destroys individual initiative and so deterts scientific medical progress, therefore, be it

RESOLVED, That the House of Delegates of the New Hampshire Medical Society go on record as opposing federal subsidization of medical schools and hospitals, since such is a form of state medicine, furthermore, be it

RECOMMENDED, That this matter be delegated to the Committee on Public Relations with power to act as future developments make advisable.

DR. LADD I move that this resolution be adopted

This motion was seconded and was carried

DR MESSINGER I have one further report to make. The Committee on Officers' Reports thanks the Committee on Medical Economics for its consideration of an unofficial fee schedule, and recommends that no action be taken on this matter at this time

In view of the fact that the subject of hospitalization insurance has been discussed and referred to the Committee on Memorials and Communications, no additional action is recommended by this committee

The House of Delegates has already voted to continue the Committee on Medical Economics

DR MESSINGER I move that that portion of the report be adopted

This motion was seconded and was carried

SPEAKER ROBINSON Are there any Councilors' reports at this time?

Councilor's Report for Merrimack County

July 7, 1937 Eagle Hotel dinner meeting. Subject "Bang's Disease." Dr Thomas M Dudley discussed the clinical aspects, Dr Robinson W Smith the veterinary aspects and Dr Travis P Burroughs the epidemiology of the disease. Dr Samuel T Ladd, of Portsmouth, president of the New Hampshire Medical Society, addressed the meeting, and Dr Thomas Walker, 2nd, Dr Cornelia Walker and Dr Harold W Epling were voted into membership

October 6, 1937 Eagle Hotel dinner meeting. Dr Clough, vice president, presided in the absence of the president, Dr Parsons. Dr Reeves Betts, of the Lahey Clinic, spoke of new developments in the field of thoracic surgery, followed by a moving picture film on the subject. Dr Simon Stone, Dr Ellsworth M Tracy, Dr Oliver P Hayward and Dr Conrad Ranger were voted into membership

January 5, 1938 Annual meeting at the Eagle Hotel. Dr Channing Frothingham, of the Faulkner Hospital, Boston, spoke on the "Principles and Proposals" of the Committee of Physicians. Dr Carleton R. Metcalf discussed Dr Frothingham's paper, taking the negative side of the question. Officers elected were: president, Dr William P Clough, vice president, Dr J Dunbar Shields, secretary treasurer, Dr Warren H Butterfield, censors, Dr Henry H Amsden (3 years), Dr McLean J Gill (2 years) and Dr William P Clough (1 year), Delegates, Dr Thomas M Dudley, Dr Herbert B Messinger, and Dr Warren H. Butterfield, auditors, Drs Harold W Epling and Eugene Chamberlain.

Drs Edward Putnam of Warner and Robert Beaudet, of Franklin, and Drs Joseph Clough and William Clough, of New London, were elected to membership

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES Most of the evidence on these films is negative. He has a considerable mass of calcified glands at both lung roots. There is no definite elevation of the diaphragm and no evidence of active disease in the chest, or enlargement of the heart. In the films taken of his abdomen the outlines of the kidney are fairly well shown on the right side and I should say that it was about normal in size and shape. The liver edge is also seen. I should not say it was enlarged although there is some other evidence that does suggest it in this film in that the stomach seems to lie more to the left than is usual, which is suggestive of enlargement of the left lobe of the liver. I do not believe there is general enlargement of the liver. We also made a study of the esophagus but there is no evidence of esophageal varices, which might help some. In the colon we have an abnormality of position. The cecum apparently lies high under the edge of the liver, and this I take to be the appendix. I think this is the lower margin of the liver. The hepatic flexure is pushed down a bit. The colon empties normally and shows a normal mucosal pattern. I should agree with the interpretation in the report that there is no evidence of intrinsic disease. Certainly there is nothing that suggests malignant disease except possibly the vague suggestion of an enlarged lobe of the liver.

DIFFERENTIAL DIAGNOSIS (continued)

DR. BREED We have two bits of evidence, the paragraph stating that the liver on direct examination was markedly enlarged, and the statement that there was a suggestive mass in the epigastrium by x-ray.

DR. MALLORY It was observed by a number of people and all agreed upon it.

DR. HOLMES I think you should take the clinical evidence in a question of enlargement of the liver. It is certainly as good if not better than the x-ray, both are unreliable.

DR. ARTHUR W. ALLEN If I remember correctly, this liver felt somewhat nodular to some of us.

DR. BREED That is interesting—and new evidence.

DR. MALLORY Also, I might remark, on statistical grounds an unreliable observation.

DR. ALLEN The history does not state it, but this man had considerable pain radiating through to his back.

DR. HOLMES I should like to ask why the Graham test was unsatisfactory.

DR. MALLORY It was unsatisfactory because large amounts of barium were retained in the

colon. Presumably there were overlapping shadows.

DR. BREED The problem now resolves itself to this: Did this man suffer from primary hypertrophic biliary cirrhosis or did he have primary cancer of the bile ducts or metastatic cancer of the liver? It is fairly clear that he had no portal cirrhosis. He had no ascites, no splenic enlargement, no esophageal varices, and in view of the forty per cent dye retention a negative Takata-Ara test is probably good evidence against portal cirrhosis. I cannot explain on the basis of biliary cirrhosis alone a 4+ guaiac test. We recently had a discussion as to the production of varicosities of the esophagus caused by biliary cirrhosis alone. It is my impression that biliary cirrhosis as such does not produce varicosities of the esophagus with consequent bleeding.

Were there any negative guaiacs on the stools?

DR. MALLORY I could find the report of only one stool examination and that showed the positive guaiac.

DR. BREED We are told in one place that the liver was smooth and tender, in another, that there were some nodules in it. Which opinion shall we accept? Let us go back over the history. It is true that he had lost only 8 lb., malignant disease is unlikely. His story of a sensation of fullness and inability to eat much because he was stuffed with food would put it on a mechanical basis rather than a toxic basis, it seems to me. He was operated on for diagnosis obviously, not for treatment, and it is our duty to guess what was found at the laparotomy. My guess is that primary biliary cirrhosis comes first, because I cannot find anything in the story or in the x-ray or in the laboratory work to point to the source of a malignant disease or to portal cirrhosis. Of course, the second guess is primary carcinoma of the liver.

DR. WYMAN RICHARDSON Would you consider a diagnosis of catarrhal jaundice?

DR. BREED Yes, I would entertain it.

A PHYSICIAN The 40 per cent dye retention is a good deal for catarrhal jaundice, is it not?

DR. BREED I do not know.

DR. MALLORY It seems to me that would indicate a certain amount of decreased liver function. I cannot remember your having mentioned in your discussion the "shots of Scotch and gin." Do you take them seriously?

DR. BREED No, because there is no evidence here that this is portal cirrhosis. If he had no ascites, no splenomegaly, and no demonstrable esophageal varices, and has a negative Takata-Ara test, with a 40 per cent dye retention, I should be very much against a diagnosis of portal cir-

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24251

PRESENTATION OF CASE

A forty-seven-year-old, white, American electrical engineer entered the hospital with the complaint of stomach trouble of four weeks' duration.

Four weeks before entry he had a sudden attack of nausea followed by two episodes of vomiting. This occurred in the evening. He felt rather poorly at that time, but the following morning felt much better. However, he noticed the onset of a dull heavy ache in the abdomen around the umbilicus and had the sensation that there was a lump in that region. He also found that he was unable to eat a full meal without having the sensation of being stuffed with food, although he had no more nausea or vomiting. He had considerable flatus, but no borborygmus, and no actual abdominal pain. During his illness his stools were darker than usual and for the first time in his life he had to take a daily cathartic in order to have bowel movements. His symptoms continued practically unchanged up to the time of entry. He had no hematemesis, melena, or jaundice. During his illness he had lost about 8 lb in weight. For ten years before entry he had taken four or five "shots" of Scotch whisky or gin each night, but stated that he was never drunk. His past history was otherwise negative, and his family history was noncontributory.

Physical examination revealed a fairly well-developed and nourished man showing evidence of recent weight loss. The skin was somewhat sallow, and there was a telangiectasis measuring 1 mm in diameter at the mid-point of the right costal margin. The sclerae were slightly icteric. The heart and lungs were negative, and the blood pressure was 135 systolic, 80 diastolic. The right diaphragm was definitely higher than the left. The liver was markedly enlarged, extending four fingerbreadths below the costal margin. The edge was smooth and very tender. The spleen could not be made out. A rectal examination was negative.

The temperature was 99°F, the pulse 110. The respirations were 20.

The urine contained 1+ bile but was otherwise negative. The blood showed a red-cell count of 4,380,000 with 80 per cent hemoglobin and a white-cell count of 7800 with 89 per cent polymorphonu-

clears. The stools were brown in color and gave a 4+ guaiac test. The icteric index was 12, and the van den Bergh on the blood serum was 36 mg per cent, biphasic. A Takata-Ara test was negative, a blood Hinton was negative. The serum protein was 6 gm per cent. A sedimentation rate determination gave a maximum fall of 21 mm in fifteen minutes with 63 per cent plasma. A liver function test gave, 40 per cent dye retention.

An x-ray of the chest and a flat film of the abdomen were normal except for a suggestive mass in the epigastrium, corresponding to the left lobe of the liver. Examination of the gastrointestinal tract by a gastrointestinal series and a barium enema showed no evidence of intrinsic disease. A Graham test was unsatisfactory.

An electrocardiogram showed occasional auricular premature beats but no other abnormalities.

An exploratory laparotomy was performed thirteen days after entry.

DIFFERENTIAL DIAGNOSIS

DR. WILLIAM B. BREED. In order to make this short I am going to assume that there was nothing above the diaphragm to warrant a diagnosis of liver disturbance due to disturbed circulation, either in the pulmonary or coronary circuit. We shall confine our attention to the organs below the diaphragm.

This man obviously had either some intrinsic liver disease, some disease outside which was causing pressure, or he had metastases to the liver.

In the first place, I should like to know whether that temperature of 99°F was an average temperature and whether while he was in the hospital he became so sick that they operated on him as a form of treatment.

DR. TRACY B. MALLORY. I do not believe he had ever had any significant grade of fever.

DR. BREED. I assume he stayed in the hospital to be studied, and that finally it was decided to explore his abdomen for diagnosis.

He had no anemia. He had mild jaundice. The Takata-Ara test was negative, and there was 40 per cent dye retention on the liver test. The sedimentation rate was high, the corrected rate being about 1 mm per minute. The statement that the gastrointestinal series and barium enema showed no evidence of intrinsic disease seems to me somewhat evasive, and makes me suspicious that there was something outside the gastrointestinal tract which might help us in making a diagnosis, perhaps some malignant disease with metastases. I should like to review the x-ray films to see if there is anything that would help us to make a diagnosis of primary carcinoma of the liver.

bread and tea. During the five weeks before entry constipation became much more severe, so that it was necessary for him to take cathartics three or four times a week. Some of his stools were black in color, and on three occasions were definitely tarry. During the two months before entry he lost 15 lb in weight. He had no nausea, vomiting, hemoptysis, jaundice, fever, chills or red blood in his stools. He had slight dyspnea on exertion and slight edema of the ankles in the evening, but no marked cardiorespiratory symptoms. Three years before entry he had a suprapubic prostatectomy for urinary frequency, urgency, dribbling and nocturia. After operation the frequency and nocturia persisted, but the other symptoms were relieved. His past history was otherwise essentially negative and his family history noncontributory.

Physical examination revealed a well-developed and nourished man in no acute discomfort. Both pupils were slightly irregular and reacted sluggishly to light. There was an old fracture of the left clavicle with 4 cm of shortening and resulting deformity of the chest. There were bulging posteriorly below the scapula and flaring of the rib cage of the left costal margin. The left diaphragm was slightly elevated and did not move on deep inspiration. Beneath the angle of the scapula on the left there were slight dullness, diminished tactile and vocal fremitus, and absent breath sounds. Above the angle of the scapula breath sounds were diminished. Anteriorly in the left axilla the percussion note was tympanic, and definite peristaltic sounds could be heard. The heart was not enlarged, but there was an apical systolic murmur. The blood pressure was 180 systolic, 120 diastolic. There was some tenderness without spasm in the right-upper quadrant, and the liver edge was percussed 3 cm below the costal margin. There was a suprapubic scar with a small hernia. Proctoscopy was negative except for a small polypoid thickening of the mucosa on the anterior wall, 6 cm from the anus.

The temperature was 98.6°F., the pulse 75. The respirations were 20.

The urine examination was negative except for numerous white cells in the sediment. The blood showed a red-cell count of 5,100,000, with 80 per cent hemoglobin, and a white-cell count of 7000. Guaiac tests on five stools were all negative. A blood Hinton test was negative. An electrocardiogram was within normal limits.

An x-ray of the chest showed a normal right diaphragm and lung. On the left the diaphragm was elevated and showed paradoxical motion with gas in the bowel beneath it. The left lung field was clear. The heart was normal in appearance, and the aorta was tortuous and perhaps slightly dilated. A gastrointestinal series showed a normal

esophagus. As the barium enema entered the stomach, the fundus was seen to be the most dependent portion. The barium ascended to the body, which was the highest portion of the stomach, and lay directly beneath the high paralyzed diaphragm. From this point the barium descended to the pyloric antrum which lay directly over the cardia. The duodenal cap which was directed downward was constantly irregular and showed a definite fleck. Two barium enemas were negative for intrinsic disease, although there was marked spasm of the entire descending colon. However, relaxation and filling were observed along its entire extent, and no abnormalities were recognizable in the mucosal pattern. X-rays of the spine and pelvis showed no evidence of metastases. There were areas of calcification in the region of the left kidney and a long dense oval shadow in the left side of the true pelvis which could have represented a large ureteral stone. An intravenous pyelogram showed normal filling of the pelves, calices and ureters, except in the region of the above-described area of calcification where the left ureter failed to fill. However, there was no other evidence of obstruction.

He remained in the hospital three weeks and improved considerably on an ulcer regime. He was discharged on a six-meal bland diet with tincture of belladonna.

Final admission (sixteen months later). The interval history was very incomplete because of lack of co-operation. Following discharge he gained weight and felt reasonably well except for occasional epigastric distress. He followed his diet faithfully, but took little belladonna. A few weeks before re-entry he began to lose his appetite, and both his epigastric pain and his constipation increased. About two weeks before re-entry he noticed swelling of his abdomen and ankles and began to have a cough productive of moderate amounts of thick yellow sputum. He had some nausea, and his stools became tarry. He was given white pills by his physician which seemed to increase his pain. Gradually he became weaker and somewhat irrational. During the week before re-entry his stools became loose and his bowels were apt to move involuntarily when he coughed. On the day before re-entry he vomited small amounts of black material on three occasions. He was very weak, almost fainted several times and passed many black loose stools.

Physical examination revealed a well-developed and nourished man in no acute distress but apparently very weak and somewhat drowsy. There was marked pallor of the skin and mucous membranes. The examination of the chest was essentially the same as on the previous admission. The

rhosis. However, he has some blood in his stool, and I cannot explain that.

DR ALLEN I was the mechanic in this case for the purpose of diagnosis, just as Dr Breed has suggested. There was a good deal of discussion before operation as to the diagnosis, and a considerable amount of thought was given to the possibility of carcinoma of the pancreas with metastases to the liver. At operation, however, there was no evidence whatever of malignant disease. There was no evidence of disease in the gall bladder or bile ducts. The liver was uniformly enlarged, and it was obvious that his disease was one of intrinsic liver disorder. A biopsy from the liver edge was taken and no more done.

DR BREED Where did his bleeding come from?

DR ALLEN I have a feeling that it was a single observation and probably not from blood in the gastrointestinal tract.

PREOPERATIVE DIAGNOSIS

Carcinoma of pancreas with metastasis to liver

DR BREED'S DIAGNOSIS

Hypertrophic biliary cirrhosis of the liver

ANATOMICAL DIAGNOSIS

Acute alcoholic cirrhosis

PATHOLOGICAL DISCUSSION

DR MALLORY Over and over again at these exercises we have had cases of cirrhosis of the liver with one or sometimes many positive guaiacs on the stools and nothing at autopsy to explain them. I am sure any patient with jaundice can have from time to time positive guaiacs in the stool.

The biopsy in this case showed liver cells which were very largely filled with fat but here and there among the fatty cells were some that contained quite clear hyaline degeneration of the type that is found in alcoholic cirrhosis, and that, so far as we know, is specific for it. This is a type of case that we see comparatively seldom at this hospital. At the Boston City Hospital within the past four or five years they have had almost an epidemic of it. Their patients have comprised a group of patients from the lowest social strata who have been drinking very excessively, ever since prohibition, alcohol which they can purchase without prescription at any drugstore. Many have died of acute liver insufficiency with histories of drinking from a pint to a quart, sometimes even more of slightly diluted alcohol. That type of case does not seem to come into this hospital. Our most nearly similar cases have come from the private pavilions rather than the general wards. There is no doubt from the biopsy findings in

this case that it is alcoholic and not biliary cirrhosis, though it is in fact so acute that it can hardly be called a cirrhosis, there being as yet almost no fibrosis. The spleen was not enlarged. It represents the earliest initial stage. Had this same process kept up for years it would have caused an atrophic portal cirrhosis. There must always be an initial stage for portal cirrhosis. We do not often see patients in that stage because they do not die then. The subsequent history of this patient added considerable confirmatory evidence for our diagnosis. Postoperatively he developed very characteristic delirium tremens.

A PHYSICIAN There is marked decrease in liver function, if this is such an early stage.

DR MALLORY A large proportion of the liver cells were filled with fat. That certainly would not improve their function.

A PHYSICIAN There is no reason to suspect the left lobe of being enlarged? It was a very uniform enlargement, I take it.

DR MALLORY Yes, it was quite a large liver. In this stage it is possible for a liver to weigh 4 or 5 kg., which is about as large as any liver we see except in occasional cases of metastatic disease.

CASE 24252

PRESENTATION OF CASE

First admission A seventy-six-year-old, unemployed Irishman entered the hospital with the complaint of pain in the right side of his chest of six weeks' duration.

All his life he had had attacks of indigestion after meals which lasted only a few minutes and were relieved by soda. He also had constipation, and for many years had noticed that if he swallowed food or liquids very rapidly they would appear to stop temporarily in his epigastrium. Rubbing that area would dislodge them. About three months before entry he began to have attacks of dull sickening pain in the upper abdomen which occurred after lifting heavy objects and radiated to the left chest, right-lower quadrant, right hip, down the right leg, and occasionally to both chests, to the right ear and down the right arm to the tip of the middle finger. The onset of the pain had no relation to the intake of food or to exercise. At first it was partially relieved by taking whisky, but later this aggravated the pain. He soon found that lying down always brought relief, especially if he placed several pillows beneath his back. The taking of milk and soda was also helpful. This pain became progressively worse and was practically constant during the six weeks before entry. He restricted his diet to malted milk,

bread and tea. During the five weeks before entry constipation became much more severe, so that it was necessary for him to take cathartics three or four times a week. Some of his stools were black in color, and on three occasions were definitely tarry. During the two months before entry he lost 15 lb in weight. He had no nausea, vomiting, hemoptysis, jaundice, fever, chills or red blood in his stools. He had slight dyspnea on exertion and slight edema of the ankles in the evening, but no marked cardiorespiratory symptoms. Three years before entry he had a suprapubic prostatectomy for urinary frequency, urgency, dribbling and nocturia. After operation the frequency and nocturia persisted, but the other symptoms were relieved. His past history was otherwise essentially negative and his family history noncontributory.

Physical examination revealed a well-developed and nourished man in no acute discomfort. Both pupils were slightly irregular and reacted sluggishly to light. There was an old fracture of the left clavicle with 4 cm of shortening and resulting deformity of the chest. There were bulging posteriorly below the scapula and flaring of the rib cage of the left costal margin. The left diaphragm was slightly elevated and did not move on deep inspiration. Beneath the angle of the scapula on the left there were slight dullness, diminished tactile and vocal fremitus, and absent breath sounds. Above the angle of the scapula breath sounds were diminished. Anteriorly in the left axilla the percussion note was tympanic, and definite peristaltic sounds could be heard. The heart was not enlarged, but there was an apical systolic murmur. The blood pressure was 180 systolic, 120 diastolic. There was some tenderness without spasm in the right-upper quadrant, and the liver edge was percussed 3 cm below the costal margin. There was a suprapubic scar with a small hernia. Proctoscopy was negative except for a small polypoid thickening of the mucosa on the anterior wall, 6 cm from the anus.*

The temperature was 98.6°F, the pulse 75. The respirations were 20.

The urine examination was negative except for numerous white cells in the sediment. The blood showed a red-cell count of 5,100,000, with 80 per cent hemoglobin, and a white-cell count of 7000. Guaiac tests on five stools were all negative. A blood Hinton test was negative. An electrocardiogram was within normal limits.

An x-ray of the chest showed a normal right diaphragm and lung. On the left the diaphragm was elevated and showed paradoxical motion with gas in the bowel beneath it. The left lung field was clear. The heart was normal in appearance, and the aorta was tortuous and perhaps slightly dilated. A gastrointestinal series showed a normal

esophagus. As the barium enema entered the stomach, the fundus was seen to be the most dependent portion. The barium ascended to the body, which was the highest portion of the stomach, and lay directly beneath the high paralyzed diaphragm. From this point the barium descended to the pyloric antrum which lay directly over the cardia. The duodenal cap which was directed downward was constantly irregular and showed a definite fleck. Two barium enemas were negative for intrinsic disease, although there was marked spasm of the entire descending colon. However, relaxation and filling were observed along its entire extent, and no abnormalities were recognizable in the mucosal pattern. X-rays of the spine and pelvis showed no evidence of metastases. There were areas of calcification in the region of the left kidney and a long dense oval shadow in the left side of the true pelvis which could have represented a large ureteral stone. An intravenous pyelogram showed normal filling of the pelves, calices and ureters, except in the region of the above-described area of calcification where the left ureter failed to fill. However, there was no other evidence of obstruction.

He remained in the hospital three weeks and improved considerably on an ulcer regime. He was discharged on a six-meal bland diet with tincture of belladonna.

Final admission (sixteen months later). The interval history was very incomplete because of lack of co-operation. Following discharge he gained weight and felt reasonably well except for occasional epigastric distress. He followed his diet faithfully, but took little belladonna. A few weeks before re-entry he began to lose his appetite, and both his epigastric pain and his constipation increased. About two weeks before re-entry he noticed swelling of his abdomen and ankles and began to have a cough productive of moderate amounts of thick yellow sputum. He had some nausea, and his stools became tarry. He was given white pills by his physician which seemed to increase his pain. Gradually he became weaker and somewhat irrational. During the week before re-entry his stools became loose and his bowels were apt to move involuntarily when he coughed. On the day before re-entry he vomited small amounts of black material on three occasions. He was very weak, almost fainted several times and passed many black loose stools.

Physical examination revealed a well-developed and nourished man in no acute distress but apparently very weak and somewhat drowsy. There was marked pallor of the skin and mucous membranes. The examination of the chest was essentially the same as on the previous admission. The

blood pressure was 120 systolic, 70 diastolic. The abdomen was pendulous and somewhat tympanitic. There was slight tenderness in the midepigastrium, and the liver edge was percussed 4 cm. below the costal margin. No masses were felt. Rectal examination was negative. The patient was lying in a thin brownish-black rectal discharge.

The temperature was 99.5°F., the pulse 110. The respirations were 20.

The urine examination was negative except for numerous white cells in the sediment. The blood showed a red-cell count of 2,500,000 with 55 per cent hemoglobin, and a white-cell count of 14,300 with 90 per cent polymorphonuclears. The guaiac test on the stool was 4+. The blood Hinton was negative. The nonprotein nitrogen of the blood serum was 62 mg. per cent. A urine culture gave nonhemolytic streptococci and a heavy growth of *Bacillus proteus*.

He continued to pass changed blood by rectum, some of which was dark red in color. He was put on a first-stage gastric diet and given a transfusion but in spite of this his red-cell count fell to 970,000 and he died on the fourth day.

DIFFERENTIAL DIAGNOSIS

DR. ALLEN BRAILEY. I am particularly interested to know whether the x-ray examination indicates that all the abdominal organs were beneath the diaphragm.

DR. GEORGE W. HOLMES. Yes. I would interpret this as evidence of paralysis of the diaphragm without an explanation of the cause. The stomach was inverted so that the greater curvature was in contact with the diaphragm and the lesser curvature pointing down. I think this happens fairly frequently when the diaphragm is paralyzed. Sometimes it is accompanied by torsion, but I do not think that is so here. The description of the deformity of the duodenum with a fleck suggests an active duodenal ulcer. It is also stated that there is a stone in his kidney as well as ureter. The barium enemas were negative except for increased irritation in the colon.

DR. BRAILEY. It seems to me that when this patient was discharged the first time there were at least three diagnoses one could make. He presumably had ureteral calculus of some size, but it does not seem to have interfered with the function of the kidney or ureter. He also had a duodenal ulcer. The third diagnosis involves the question, What was the matter with his diaphragm and the left side of his chest? I believe he had eventration of the diaphragm. It is difficult to differentiate eventration and hernia, but there is a categorical statement here about the position of the diaphragm which makes hernia unlikely.

Eventration of the diaphragm is a very rare condition. There are about twenty times more diaphragmatic hernias than eventrations, and when it occurs it is on the left side about twenty times oftener than on the right side. It is four times commoner in men. It was first described in 1784 by Pyle and given its present name in 1829 by Cruveilhier. It is a very poor name but from long usage it is still retained. There has been a great deal of discussion as to the cause of eventration. Most people feel it is congenital because there is hypoplasia of the left lung, not atelectasis. Furthermore there seldom appears to have been mechanical cause that could have brought it on. Often it has been discovered very early in life. The diagnosis is made almost entirely by x-ray and positively by pneumoperitoneum, whereby one can demonstrate air under the diaphragm and above the abdominal viscera. Dr. Lord in 1926, in discussing this condition, thought pneumoperitoneum a radical procedure and a dangerous one. Nowadays we use it more commonly and perhaps feel that it is less dangerous. The behavior of the diaphragm on respiration is not important. One would think there would be paradoxical motion of the paralyzed leaf. That is not always the case, — it may move normally, or not at all, or in reverse direction. Certain other points are interesting, one of which is mentioned here, — Hoover's sign, with flaring of the rib margin on the affected side because of lack of diaphragmatic pull which should be present. Furthermore the mediastinum is pulled toward the good side because the negative pressure is greater on the good side than on the side of eventration. The heart ordinarily is displaced to the right in left eventration and the diagnosis of dextrocardia is often made. There may be no symptoms at all. The condition is frequently discovered accidentally. On the other hand, very distressing symptoms such as pain after meals, may be found. Bleeding has been reported occasionally. I discovered that Verbruycke* reported a case where kinking was so severe there was necrosis of the gastric mucosa and fatal hemorrhage. There may be cough, dyspnea, cyanosis and so forth, and there may be partial obstruction of the gastrointestinal tract, either stomach or colon, from kinking of the viscera under the high diaphragm.

Coming back from these generalities to the case at hand the patient was discharged on an ulcer diet which relieved most of his symptoms. He gained weight again, and a good deal of his ill health must have been due to the ulcer. He came back sixteen months later to die of hemorrhage, I judge. The hemorrhage was not a single mas-

*Verbruycke, J. R. Jr. Eventration of the diaphragm. Surg. Gynec. & Obst. 40:415-420, 1925.

sive affair, but repeated hemorrhages in the digestive tract too frequent and too gross for compensation by blood-forming organs. The questions that arise are, Why did he bleed? And where did he bleed? We have read here of polypoid thickening of the rectal mucosa. I do not see that we can pin the hemorrhage on the colon. In the first place cancer was carefully searched for and ruled out apparently. In the second place the blood is almost entirely old changed blood. He vomited dark-brown material which was probably blood and furthermore, I do not think that bleeding from cancer of the colon is very often fatal.

Might he have had cirrhosis of the liver or esophageal varices? We have a definite report that the esophagus was normal. The liver was reported below the costal margin. Nothing was said about the upper border of the liver, which is an essential point and too often left out. In all probability the liver was not small, however, as it would be in cirrhosis which had developed to the point where fatal hemorrhage would occur. He has some evidence of ascites and edema of the ankles, but that can well be explained on the basis of hemorrhage and the lowering of blood protein and osmotic pressure of the blood.

As regards bleeding from the gastric mucosa Dr. Bock, about five years ago, reported cases of very severe (I am not sure if fatal) oozing of blood in cases of diaphragmatic hernia. It can be very extensive and while this is eventration, not hernia. I do know that similar hemorrhage can occur in eventration where the stomach or bowel is kinked.

However, we know he has duodenal ulcer and we know that duodenal ulcers can cause fatal hemorrhage, especially in a man of this age. I think he died from hemorrhage from the duodenal ulcer.

Are there any other diagnoses we ought to consider? The point is made that he had a urine culture showing nonhemolytic streptococci and *Bacillus proteus*. Dr. Albright has seen some interesting cases of *Bacillus proteus* in the kidneys where the urine was persistently alkaline, and invariably there were massive stones in the kidneys. Nothing is said about alkaline urine here, and nothing very much about the kidney stones. I should suppose that probably these were either casual contaminants or represent a minor degree of infection which commonly occurs in these old people with prostatic obstruction. Cardiac infarction might well have occurred in a man of his age but I think the drop in blood pressure and so forth can be as well explained by hemorrhage. He has been raising thick yellow sputum, but I do not know what to make of that. I think he had eventration of the diaphragm and kidney

tract stones, and duodenal ulcer with fatal hemorrhage therefrom.

X-RAY INTERPRETATION

DR. HOLMES. This film shows the position of the diaphragm on the left side and below it the viscera filled with gas. It is rather unusual with a diaphragm as high as this that there is no displacement of the heart. The opposite lung is clear. In the examination of the gastrointestinal tract the fundus of the stomach is here. This is the pylorus. This is the greater curvature, so that the stomach is exactly upside down. Then in the duodenum we have this characteristic deformity which has the appearance of a large ulcer, perhaps being the crater. Here is another film that shows the deformity in the colon. There may be some increased peristaltic activity, but there is no evidence of an organic lesion. In going through this group of films hurriedly this is the only one I could find of the urinary tract without barium and apparently there are shadows in the region of the kidney. That could be stone. There is some motion, and I would want a confirmatory film before I made a positive diagnosis of stone.

CLINICAL DISCUSSION

DR. WILLIAM B. BREED. I agree with Dr. Brailey that this man died of hemorrhage from his duodenal ulcer. There was some discussion as to whether anatomically the fracture of the clavicle could have been responsible for paralysis or crushing of the left phrenic nerve and I am not too clear anatomically about that. Could the injury of the fracture crush the phrenic nerve and produce this high diaphragm?

DR. FRANKLIN G. BALCH, JR. In the series of fractures of the clavicle in this hospital we have never seen that complication.

DR. BREED. What is the anatomic relation between the phrenic nerve and the clavicle?

DR. HOLMES. The phrenic nerve seems very deep.

CLINICAL DIAGNOSES

Bleeding duodenal ulcer with secondary anemia
Eventration of stomach and intestines
Paralysis of left diaphragm

DR. BRAILEY'S DIAGNOSES

Eventration of diaphragm
Duodenal ulcer
Nephrolithiasis

ANATOMICAL DIAGNOSES

("Eventration of the diaphragm")
Gastric ulcer with hemorrhage

Pulmonary atelectasis, left
 Nephrolithiasis, left
 Pyelonephritis, chronic, left
 Operative scar Suprapubic prostatectomy

PATHOLOGICAL DISCUSSION

DR TRACY B MALLORY The autopsy showed what one would expect in so-called eventration of the diaphragm. The left diaphragm was extremely high and the great omentum had curled up into the space immediately beneath the diaphragm so that it lay on top of all the other abdominal contents. It had pulled the colon up with it, and that in turn had rotated the stomach by traction on the gastocolic ligament so that in order, from above downward we found omentum, colon and stomach. We disagreed with the x-ray department about the location of the ulcer. We found a large, penetrating, gastric ulcer and noticed nothing in the duodenum. It was immediately adjacent to the pylorus but definitely on the gastric side. In its center was quite a large artery, evidently eroded, and the source of the hemorrhage.

There were numerous stones in the pelvis of the left kidney and a long stone in the left ureter. The kidney on that side was very atrophic and showed marked scarring — evidence of healed pyelonephritis. We have sections of the two phrenic nerves and I think there is a definite difference between the two. The one on the left shows some evidence of degeneration, the right is normal. We could not make out that the nerve was pressed upon by the clavicle deformity.

DR CHESTER M JONES There are two points in the history which I think should lead one to suspect a diaphragmatic lesion. The pain and distress were modified by change in position, there was difficulty in swallowing. The distribution of the pain, which was very marked, would also sug-

gest that he had a definite involvement possibly of more than the stomach alone, which would fit in perfectly well with an accumulation of organs under a high diaphragm and resulting traction. The other point is that the physical signs were fairly characteristic, — dullness and signs of fluid at the left base, — and yet they were not so marked as in other cases. It is not uncommon to have pleural effusion suspected and dry taps made a number of times before the diagnosis is considered.

DR. MALLORY I forgot to add that at autopsy the left lung was completely atelectatic, but that could not have been the case for any very long period before death.

DR. BRAILEY Was it a small lung?

DR. MALLORY It seemed small, naturally, because of the atelectasis. We did not attempt to blow it up and I do not know whether it would have looked small if we had done that or not. It is too bad we did not do it.

DR. BRAILEY If it were a congenital lesion it probably would be small, would it not?

DR. MALLORY Yes.

DR. GEORGE W W BREWSTER Could anything have been done by surgery?

DR. MALLORY You could certainly have done nothing about the diaphragm. Moreover, if you tacked the stomach back in normal position I do not believe it would have stayed. There was a hole there that had to be filled with something. I suppose the portion of the stomach containing the ulcer could have been resected with profit.

DR. HOLMES We had a case recently with the stomach in the same position where the surgeons turned it down and fastened it to the anterior abdominal wall.

DR. MALLORY Has it stayed there?

DR. HOLMES I do not know.

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SUBSTANDARD PRACTICE OF MEDICINE

THE recently drafted resolve introduced by the Committee on Public Health of the Massachusetts Legislature is an attempt to deal in a tentative and somewhat hesitant fashion with a problem in medicine that has rarely been clearly formulated. The resolve provides for an interim study of the registration of osteopathic physicians and of chiropractors, of the creation of a so-called basic-science board and of a single board of the healing arts. This is not a new idea in Massachusetts and the placing of all persons under a single board of

registration was recommended by the commission which made its report in 1925. The resolve provides also for a study of what is sometimes called the "poison law," in the light of recent disastrous experiences with certain poisonous drugs, the traffic in which has not hitherto been regulated. This last topic need not be considered in connection with substandard practice.

The rising standards for the qualification of physicians in the past seventy-five years have worked considerable hardship on substandard practitioners of medicine while they have worked incalculable benefit for the public. In the past one hundred and fifty years, there have been chartered over four hundred and fifty medical schools in the United States, most of which proved to be ephemeral and their names have never been heard by most persons of middle age. But the urge to study and practice medicine is powerful, whatever the motive, and there has been an eruption of cults, which have sought and frequently found recognition by the legislative bodies of various states.

The history of the cult in medicine can be outlined briefly. By chance someone treats a sick person in an unusual way and the patient recovers. Other patients are treated, the successes are remembered, the failures forgotten. The happy results are attributed to the method, and soon a school of therapy based on a new theory of disease is developed. One is reminded of the advice of the wise old physician to a young patient who inquired anxiously "Shall I take this new treatment?" "By all means," he replied, "while it is still new. Its virtue will disappear when it is old."

The cult grows, holds its own for a while, wanes and disappears. Sometimes it makes a permanent contribution to the stream of medicine, but from its birth it is doomed. One cannot predict the span of its life, but a very vigorous cult may endure through three generations of men. Some die in infancy, some in childhood. It is on this account that Massachusetts should beware of giving formal recognition to cults in medicine. The

single standard of qualification for all who practice medicine, of which Massachusetts was once so justly proud, should be emphasized, and every effort should be made to restore it

Seventy-five years ago a cultist might easily obtain a charter for a medical school and incorporate his ideas in as little or as much medicine as he saw fit. As this is no longer possible, he seeks recognition for his cult by his own separate board of registration which will approve his own schools.

The basis for his claim is the provincial and ignorant assertion that since he uses no drugs he is not practicing medicine. By repeating this false statement over and over again he persuades those minded like himself, in and out of legislative halls.

There is a tendency for the cultist schools to become more and more like standard schools of medicine. One of the arguments set forth in favor of the recently enacted law that postpones the effective date of the activity of the Approving Authority was that not sufficient time was given by the original statute for schools of osteopathy to reach the approved standards. Such assimilation to standard schools of medicine appears to a disinterested person to be a move in the right direction. But among osteopathic physicians there are some partisans with keener insight than the average who think it is the beginning of the end and who have issued warnings against the tendency. This assimilation is a concession that osteopathy is not enough, and a recognition that osteopathy is a part of the practice of medicine, and such concession and recognition inevitably lead to the view that osteopathy at its best can be regarded as only one possible method of treatment among the many resources of the healing art. What the residue, if any, of osteopathic procedures will be, one cannot say. Perhaps some form of "manipulative surgery" will include whatever there is of permanent good. But its theory as to the cause of disease has never received any scientific support. The chiropractic schools—at least some of them—are improving so that in certain respects they resemble the poorer schools of medicine seventy-five years ago, the names of which are now forgotten. Why

go back to those obsolete standards of medical education?

The secret of the power of the cult is the esoteric quality of its dogma. As soon as there is acknowledged the necessity for aught else,—as by approximating its curriculum to that of the standard medical school,—the corrosive poison has entered its system and, as a matter of experience, can never be eliminated.

Just what will come from the study proposed by the resolve no one can foretell, but anything that will throw more light on the growth, development and actual worth of osteopathy and chiropractic and their schools should be welcomed.

HUNTINGTON MEMORIAL HOSPITAL

THE annual report of the Collis P. Huntington Memorial Hospital calls renewed attention to the excellent work being done by the oldest special cancer hospital in the community. Although limited in its number of beds, its active outpatient department and above all the importance of its work have done much to forward the cause of cancer control.

The hospital is in no small part a monument to the vision and unremitting work of the late Dr. Robert B. Greenough, whose clear insight of the need for both fundamental research in cancer and the development of methods of diagnosis and therapy, as well as training younger members of the medical group in the knowledge of cancer, has made possible the high state of development of cancer control in Massachusetts.

The outstanding advance at the hospital in the past year has been the installation of the new Van de Graaff-Trump supervoltage x-ray generator, which enables the hospital to treat patients with the highest effective x-ray voltage ever generated for therapeutic purposes. The machine operates routinely at 1,200,000 volts, roughly equivalent to the amount of radiation that might be obtainable from 2000 grams of radium element. While it is too soon to evaluate the therapeutic results, the work will be followed with great interest by all those working in the field of cancer.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS
AND GYNECOLOGY

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330 Dartmouth Street
Boston

CASE HISTORY No. 77. PREMATURE PARTIAL
SEPARATION OF THE PLACENTA

Mrs. B. G., a twenty-two-year-old primipara in the thirtieth week of her pregnancy, was walking along the street when she started to flow and flowed enough to saturate her clothing. She went to her physician's office immediately.

Her family history was negative. Her tonsils had been removed as a child and her appendix had been taken out ten years before. She had a history of healed tuberculosis. There was no history of diabetes, scarlet fever, rheumatic fever or malignant disease.

Catamenia began at thirteen, with a regular twenty-eight-day cycle, lasting three or four days without pain. Her last period was late in July, making her due for delivery early in May.

Physical examination in October, early in her pregnancy, showed a well-developed and nourished young woman. The heart was not enlarged, there were no murmurs. The lungs were clear and resonant, there were no rales. The blood pressure was 120 systolic, 60 diastolic. Vaginal examination showed the cervix posterior and the fundus anterior.

She was seen routinely throughout her pregnancy, which was normal in every respect until the above-mentioned bleeding. Physical examination at this time, March 16, showed the uterus very irritable as though she were going into labor. It was somewhat spastic but did relax at times. The fetal heart was heard. The diagnosis of partial separation of the placenta was made and she was sent at once to the hospital. A previous examination on March 1 showed a high-breech presentation. A rectal examination at this time ruled out a placenta previa. Upon arrival at the hospital her blood was matched and cross-matched with her husband's blood which was found to be compatible. In view of the fact that the chance of the baby's survival was so small because of its prematurity, it seemed wise to treat her conservatively.

There was practically no bleeding after hospitalization, although the uterine contractions kept up and it was thought that she was going into labor. These continued off and on for about a week and then subsided. During this time there was no bleeding. She was kept in the hospital until April 11. Three days before she was allowed to go home a vaginal examination was done under aseptic conditions. It showed the cervix not flat and a breech well in the lower segment, no placenta was felt. No attempt was made to put the finger through the cervix.

She was seen at home on April 20, at which time her blood pressure was 118 systolic, 60 diastolic. A specimen of urine obtained at this time showed a trace of sugar and of albumin.

She started in labor about 6 p. m., April 20. A rectal examination at 6:45 p. m. was unsatisfactory. A vaginal examination at 8:30 p. m. showed the cervix taken up and thin and dilated about three fingers, the breech was presenting. A normal, double footling, SRA position, extraction was performed at 10:30 p. m. The child, a female, weighed 5 lb., 10 oz., and appeared in good condition. The placenta showed an area of degeneration about 7.5 cm. square, the seat of the previous bleeding. There was no bleeding after delivery, and her entire convalescence was uneventful.

Comment. The treatment of partially separated placentas before thirty-two weeks should always be conservative because the risk to the mother of abdominal delivery is not justified. As a matter of fact, most completely separated placentas at this period should be treated conservatively. If this condition arises four weeks later and the bleeding keeps up and labor does not result, then cesarean section becomes justifiable because the chance of the baby's survival at this time is excellent. In this individual case it was believed that the separation of the placenta was not complete, that labor was imminent and that the baby had just as good a chance, even though it was small, of survival after vaginal delivery as it would have had by section. There was no justifiable excuse for subjecting the mother to the added dangers of a section.

Prolonged hospitalization before viability in the absence of further bleeding is the ideal treatment. Intelligent procrastination—leaving the vagina entirely alone—in the absence of further bleeding until viability is well assured is not only justifiable but advisable, for many babies will undoubtedly be saved by this method. Routine immediate vaginal examinations before viability are contraindicated in cases of this type.

A series of selected case histories by members of the section will be published weekly.

Comments and questions by subscribers are solicited and will be discussed by members of the section.

TUBERCULOSIS*

In spite of the encouraging decline in tuberculosis, the pulmonary form of the disease is still a major public-health problem. It is one of the chief causes of death in early adult life.

The earlier the diagnosis is made, the greater the chance of stopping the disease by treatment. Early diagnosis is also of great moment to the patient's family and the community in diminishing the danger of well people getting the disease.

If you have a persistent cough with or without fever, or if you have night sweats, loss of appetite and loss of weight, if you have an attack of pleurisy or if you spit up blood, you should consult your doctor at once. In addition to a physical examination, he will want the sputum examined and an x-ray of the chest.

Financial considerations need not stand in the way. The State Department of Public Health has a diagnostic laboratory at the State House, and laboratories are maintained by local boards of health in many communities where sputums sent by physicians are examined for tubercle bacilli free of charge.

Facilities are fortunately available throughout the State for the x-ray examination of patients unable to pay and for those who have been living with them. Such persons may be referred by physicians to diagnostic outpatient departments or consultation clinics maintained by the state or county sanatoriums, or to certain tuberculosis diagnostic clinics maintained by local boards of health.

It is not to be expected, however, that in any large proportion of cases the disease will be recognized in its early stages, or proper treatment started, or measures taken to prevent spread of infection in the family and the community unless you realize (1) that in the early stages of the disease there may be no suggestive symptoms or physical signs, (2) that an early diagnosis may be possible only by x-ray examination, (3) that there is a high percentage of infection among those exposed to the disease in the family, (4) that an x-ray examination should be made of all family contacts of a patient with tuberculosis, and (5) that the investigation of school children for tuberculosis is an important means of prevention and control of the disease.

The investigation of school children, known as the Ten Year Program, was initiated by Dr. Henry D. Chadwick, our very capable Commissioner of Public Health. School children were examined on a statewide scale for the ten years following June, 1924. In the course of this survey of nearly 1,000,000 children in the investigated schools, 400,000, or 40 per cent, were tested with tuberculin and 100,000 who reacted to the test were x-rayed.

Results of far reaching importance for Massachusetts and other communities were obtained in the course of this investigation. It demonstrated the prevalence of tuberculosis in children and the significance of family contact as a source of contagion. It furnished information of importance for the prevention and control of tuberculosis in the community.

In accordance with the original plan, the State Department of Public Health terminated the Ten Year Program in June, 1934. Since then, the routine examination of school children has been carried out through the services of the state and county sanatoriums and by the State Department of Public Health in certain places where the sanatoriums are unable to furnish such service.

Facilities for the routine investigation of school children

*A. Green Lights to Health, broadcast given by Dr. Frederick T. Lord on Wednesday, June 8, and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

are by these means available in most communities in the State. In Boston during the past year, children in the parochial schools have been investigated by the Boston Health Department.

In the examination of school children for tuberculosis, a change has been made from the investigation annually of the seventh, ninth and eleventh grades. Beginning with the school year, 1937-38, examinations have been made of children in the high school grades. This has the advantage of enabling the examiners to investigate a larger number of children in one school at one time and to return to the same school when others have taken the place of children already investigated.

Owing to the usual absence of symptoms and physical signs with tuberculosis in childhood, it is only by x-ray examination that the disease can be discovered. Children whose parents sign the request slips are first tested with tuberculin and an x-ray examination is made of the children who react to the test.

* * *

Q. Dr. Lord, will you explain why it is desirable first to test the children with tuberculin and to x-ray only those who react to the test? Would it not be easier to x-ray all the children?

A. Yes, Mr. Strawson, it would be easier to x-ray all the children, but much more expensive. The test with tuberculin is a relatively simple and inexpensive procedure. The cost of the x-ray examination amounts to about \$1.00 per child.

Sensitivity to tuberculin is acquired in the course of infection with tubercle bacilli and is limited to the subjects of such infection. Reactions to tuberculin serve to reveal those children who have been infected with tubercle bacilli. This is spoken of as a screening process.

Q. How is the tuberculin test performed?

A. Until recently the children were tested by what is known as the scratch test in which the tuberculin is scratched into the superficial layers of the skin. Recently the test has been made by injecting a very small amount of this substance into, not under, the skin.

Q. Is it a painful process?

A. Only a slight prick from the introduction of a fine needle into the skin.

Q. What proportion of the children may be expected to react to tuberculin?

A. The proportion varies in different communities. In general, about 30 per cent of the high school students may be expected to react.

Q. Does the reaction to tuberculin indicate that the child is in a serious condition?

A. Not at all! The reaction to tuberculin means that there has been exposure to tubercle bacilli. The resulting infection is usually inactive and unimportant. A positive skin test to tuberculin in the absence of other manifestations is of little or no importance.

Q. What is likely to be found on x-ray examination of the children who react to tuberculin?

A. In the high schools, about 1 in 80 of the children tested may be expected to have x-ray evidence of what is called the first infection, or childhood type, of tuberculosis, with involvement of the lung and the lymph nodes about the larger air passages. In about 1 in 700 of the children tested, the adult type of pulmonary tuberculosis will be found.

Q What is meant by the adult type of tuberculosis in children?

A. The adult type of tuberculosis is a reinfection in an already infected individual. The disease is likely to be in the upper parts of the lung and is prone to undergo softening, ulceration and cavity formation.

Q Is there a difference in the importance of these two forms of the disease in children—the childhood and the adult type?

A In the high schools, the finding of at least 8 cases of the childhood type to 1 of the adult type makes the former the most important group so far as numbers go.

The two forms of the disease are, however, quite different from the point of view of seriousness.

The childhood type of the disease is usually mild and the outlook favorable. Its discovery is to be regarded as a safeguard in the opportunity afforded to prevent further infection, for instruction regarding exercise, rest and diet and for further x ray examinations. It is to be expected that, in consequence, further progress of the disease will be prevented in many cases, with resulting saving of life and the avoidance of an expensive illness. On the whole, however, because of its usual benign course the most important advantage to be derived from the discovery of the childhood type is the opportunity to find a source of infection through the investigation of family contacts.

The adult type of tuberculosis in children is serious and the outlook poor. Its discovery affords the opportunity for the institution of treatment, the elimination of a source of danger to others by removal of the child from school and the examination of family contacts.

Q In what proportion of high school children is parental consent given for the examination?

A During the last four years of the Ten Year Program, of about 88,000 children in the investigated high schools, permission was granted for the testing of only a little over half the children.

Q As the examination is paid for out of tax money and is of advantage to the children and their families, why is the proportion of consents so low?

A As the information obtained may be lifesaving and lead to the avoidance of an expensive illness, the explanation must be that the purpose and importance of the examination is not fully understood.

Q With respect to examination of family contacts, does this mean that the family contacts of all the children who react to tuberculin should be examined?

A. No. It is only the family contacts of the few children who are found to have tuberculosis by x ray examination. In addition, the importance should be emphasized of the x ray examination of all household contacts of tuberculous patients in the state, county, municipal and private sanatoriums and in the practice of physicians.

As an indication of the importance of the examination of family contacts, it may be noted that during a period of four years, practically 90 per cent of the family contacts of patients at one of the county sanatoriums were examined with the finding of the disease in over 20 per cent and active pulmonary involvement in about 8 per cent. By this means, more patients in the early and consequently favorable stages were admitted to this sanatorium than by all applications through the usual channels.

Investigation for tuberculosis should be made of grade and high school teachers, students entering the state teachers colleges, nurses in hospitals at the time of enrollment, medical students, hospital interns, nursemaids and domestic help where there are children. Investigation should

also be made of all people known to have diabetes as they are especially susceptible to tuberculosis.

Q In patients in whom an early diagnosis is made, are the results of treatment favorable?

A. The early recognition of pulmonary tuberculosis may be expected to be followed by rapid subsidence of symptoms, but physical activities even under the most favorable circumstances must be very largely restricted at least for months and permanent arrest of the disease can hardly be expected within a number of years.

Q Is there hope of recovery when the disease is beyond the early stages?

A Late recognition diminishes the chance for recovery, but much may still be done and many lives saved. It may be necessary, however, to resort to the use of more radical measures in the treatment of such cases. Important advances in treatment have been made in the development of methods for putting the affected part of the lung at rest. These methods are spoken of as collapse therapy, and the procedures are technically known as artificial pneumothorax, phrenic-nerve operations and thoracoplasty. This surgical attack is one of the most important of the recent advances in the treatment of old fashioned consumption, or what we now call pulmonary tuberculosis.

DEATHS

BREWSTER—MARY JONES BREWSTER, M.D., of Wellesley, died June 9. She was in her seventy sixth year.

Born at Brookfield, she was graduated from Wellesley College in 1883 and from the Women's Medical College of Pennsylvania in 1892.

Dr Brewster was formerly resident physician of Smith College and had served as social service head of the cotton mills at Lagrange, Georgia. Formerly a fellow of the Massachusetts Medical Society she had been retired for some time.

A sister and a brother survive her.

EVELETH—SAMUEL EVELETH, M.D., of 32 Pleasant Street, Marblehead, died June 14. He was in his fifty sixth year.

Born in Marblehead, he graduated from Amherst College in 1904 and received his degree from the Harvard Medical School in 1908. For thirty years he had been a practicing physician in Marblehead and was a trustee of the Mary Alley Hospital and a member of the staff of the Salem Hospital. Dr Eveleth was a fellow of the Massachusetts Medical Society and the American Medical Association and was a member of the North Shore Medical Society.

A sister and a brother survive him.

TASKER—FRANK E. TASKER, M.D., of West Acton, died June 19, at his home. He was in his seventy fifth year.

Born in Northwood, New Hampshire, he was graduated from Dartmouth Medical School in 1893. Dr Tasker was the oldest physician in Acton both in service and age, having practiced there for forty four years. He was the chairman of the Board of Health.

Dr Tasker was a member of the American Medical Association and a fellow of the Massachusetts Medical Society.

A half brother survives him.

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Some of the divergent opinions arose from the use of the serum in the late stages of the disease after the rash had faded—a time when antitoxin is of no value. Other false impressions were given by the inadequate standardization of many of the serums on the market, some of which were extremely weak in potency. Another reason for the divergence of opinion was the too frequently held concept of the minimum therapeutic dose. Higher doses of antitoxin should be used than those usually recommended.

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Evaluation of the results of treatment with antitoxin is particularly difficult due to the self limitation of the disease and because of its dual nature. Evaluation can be approached in two ways (1) objective study of phenomena occurring abruptly following antitoxin administration, (2) comparison of complications arising in treated and untreated cases

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THE RELATION OF THE PHYSICIAN TO INDUSTRY

MRS. EMMA SANBORN TOUSANT*

BOSTON

COMPENSATION legislation in the United States, after some twenty-five years of application, appears to be securely anchored in our industrial system, and because of the scope of the present law in the many states where it is in force, a greater opportunity than ever before is open to the medical profession to contribute to the welfare of industry. Many other forms of social legislation have sprung up in the last few years and are equally secure in our industrial world. It is no longer claimed that social legislation is on trial, and compensation insurance should be made as compulsory as old-age-assistance compensation and unemployment-insurance compensation. It is interesting to examine some of the policies of administration that have broken down opposition and gradually brought opposing factions to a sympathetic support of the fundamental principles upon which the legislation was founded, the basic one being that industry should bear the burden of the cost of all injuries to its workmen when these are attributable to hazards inherent in employment and due to its conditions. In Massachusetts, the fundamental purpose of the Workmen's Compensation Act is to give to the employee fair valuation for the loss suffered and to restore him to industry with the least possible delay. This fundamental purpose has been hampered, first, by the limitations in the early provisions of the law relating to medical treatment, and secondly, by the abuses and deficiencies that have grown up under the later provisions, together with inadequate diagnosis and treatment of many conditions by the medical profession. The profession in general has been an active force in fostering and sustaining the true spirit of the law. Its interest and co-operation have always been and still are essential to the success of the administration of the Workmen's Compensation Act.

Section 30 of Chapter 152 of the General Laws

Presented at the Fall meeting of the Massachusetts Medico-Legal Society
October 6, 1937
Chairman, Mr. C. Bussett, Industrial Accident Board

relates to medical treatment, and a résumé of the original law and its amendments may lead to a better understanding of the interpretation and rulings made by the Industrial Accident Board since the Workmen's Compensation Act became effective July 1, 1912.

The act provided that during the first two weeks after the injury "the association," which was then the "insurer," should furnish reasonable medical and hospital expenses and medicine when needed. The word "furnish" was interpreted by the Supreme Judicial Court to mean that the insurer should arrange in advance for such treatment in the ordinary case or provide that someone be at hand to do so. In other words, the statute imposed an obligation upon the insurer to furnish reasonable medical attention, but did not make it mandatory that the employee accept such attention exclusively. He could, if he wished, secure medical attention of his own selection but at his own expense.

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Practical Otolaryngology, Rhinology and Laryngology Adam E. Schlanser 315 pp Philadelphia Lea & Febiger, 1938 \$4.50

Immune Blood Therapy of Tuberculosis with Special References to Latent and Masked Tuberculosis Joseph Hollos 197 pp New York, 1938 \$2.00

The Biology of Arteriosclerosis M. C. Winternitz, R. M. Thomas and P. M. LeCompte 142 pp Springfield, Illinois and Baltimore Charles C. Thomas, 1938 \$4.00

Materia Medica Drug administration and prescription writing Oscar W. Bethea. Fifth revised edition 577 pp Philadelphia F. A. Davis Company, 1938 \$5.00

Injection Treatment of Varicose Veins and Hemorrhoids H. O. McPheeters and James K. Anderson. 315 pp Philadelphia F. A. Davis Company, 1938 \$4.50

Medical State Board Questions and Answers R. Max Goepf. Seventh edition. 644 pp Philadelphia and London W. B. Saunders Company, 1938 \$5.50

A Symposium on Cancer Given at an Institute on Cancer Conducted by the Medical School of the University of Wisconsin 202 pp Madison The University of Wisconsin Press, 1938 \$3.00

BOOK REVIEWS

Workbook on Elementary Diagnosis for Teaching Clinical History Recording and Physical Diagnosis Logan Clendening 167 pp St. Louis The C. V. Mosby Company, 1938 \$1.50

With his usual flair for discovering new ways of presenting old and significant facts, Dr. Clendening has evolved a laboratory manual for the young student of elementary diagnosis which stands midway between the paper-covered pamphlet supplied by hospitals and medical schools for the guidance of clinical clerks and the usual textbook of physical diagnosis. Several of the recently published textbooks of physical diagnosis have been characterized by eye appeal through excellent photographic illustrations at the expense of careful accuracy in the text. It is a pleasure to be able to praise the quality of Clendening's illustrations (pen drawings from photographs) and at the same time acknowledge the reliability of his text. Achievement of the latter is aided by abundant references to the citations from the works of the original discoverers of common physical signs—a custom which is happily growing among textbook authors. The reduction in price (from \$3.00 to \$1.50) is added justification for advising the second year medical student that this is a book to be placed on his 'must buy' list.

The New International Clinics Original contributions, clinics, and evaluated reviews of current advances in the medical arts Edited by George M. Piersol Volume I, N. S. 1 322 pp Philadelphia, Montreal, New York J. B. Lippincott Company, 1938 \$3.00

This quarterly volume of a periodical published since 1891 appears this year under its new editor George Morris Piersol. The purpose of the *International Clinics* from the first was to serve as a postgraduate course in medical instruction, for those unable to attend courses at the bedside, by publishing carefully edited stenographic reports of lectures or discussions in wards or amphitheatres, only at times were especially prepared original articles included. That they filled a need is indicated by the popularity attained and by the appearance of other similar publications.

The *New International Clinics*, however, has lost the distinctiveness of its predecessor. It contains seventeen excellent original contributions covering many aspects of medicine and surgery by eminent men throughout the country, but there are only thirty pages of clinics.

George R. Minot is the Boston representative on the editorial board, and there are original papers by Harold Jeghers, William H. Robey and Donald S. King of this city.

A Dissertation on Acute Pericarditis, 1836 Oliver W. Holmes 39 pp Boston Welch Bibliophilic Society, 1937

A hitherto unknown manuscript which Holmes prepared as his thesis for graduation from the Harvard Medical School, in 1836, has been brought to light among the Holmesiana at the Boston Medical Library and published by the Welch Bibliophilic Society. The text presents a study made by him upon a series of 11 cases of acute pericarditis which he observed while in attendance upon the wards of a Parisian hospital during the years 1833-35. Before going abroad he had taken two courses at a private medical school in Boston and upon his return, late in 1835, he obtained his medical degree from Harvard University.

The date at the end of the dissertation is January 12, 1836, and in the last paragraph he states that he had only three days in which to prepare the thesis, having recourse only to his own library and to the cases he had tabulated two years before in Paris, where he saw the material with Louis and Andral, his preceptors. The record is interesting as indicative of the methods of research in vogue at that time, these were largely clinical, of course, in a condition of this sort, but were supplemented by a certain amount of postmortem material, the nature and significance of which were only just beginning to be appreciated by the brilliant group of French physicians headed by Andral, Laennec, Chomel and Louis. The petty rivalries engendered by the desire to receive credit for advancement of the knowledge of disease are much in evidence—happily more so than is true of the present time.

Man Bread and Destiny The story of man's food C. C. Furnas and S. M. Furnas 364 pp Baltimore The Williams & Wilkins Company, 1937 \$3.00

Beginning with the evolutionary stages leading to present-day human dietetic practices, this book attempts to show the influences which food has exerted in the development of civilization, and in subsequent chapters explains the part played in nutrition by carbohydrates, fats, proteins, minerals and vitamins. Adequate space is given to a discussion of each of these essential constituents of a wholesome diet, with explanations of the danger incident to the omission of any one or more of them.

Enough space is given to the physiologic chemistry of nutrition to enable the lay reader to understand how the vital forces of the body are maintained. The section devoted to the vitamins makes clear the present-day knowledge pertaining to the role of these indispensable elements. In addition to the recital of facts relating to nutrition and the associated disease problem, advice concerning the economics of food supplies is presented.

This is an unusually interesting book in addition to the factual data the authors have a sense of humor and have introduced many historical references and personal opinions which help the reader to profit by the information set forth.

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THE RELATION OF THE PHYSICIAN TO INDUSTRY

MRS EMMA SANBORN TOUSANT*

BOSTON

COMPENSATION legislation in the United States, after some twenty-five years of application, appears to be securely anchored in our industrial system, and because of the scope of the present law in the many states where it is in force, a greater opportunity than ever before is open to the medical profession to contribute to the welfare of industry. Many other forms of social legislation have sprung up in the last few years and are equally secure in our industrial world. It is no longer claimed that social legislation is on trial, and compensation insurance should be made as compulsory as old-age-assistance compensation and unemployment-insurance compensation. It is interesting to examine some of the policies of administration that have broken down opposition and gradually brought opposing factions to a sympathetic support of the fundamental principles upon which the legislation was founded, the basic one being that industry should bear the burden of the cost of all injuries to its workmen when these are attributable to hazards inherent in employment and due to its conditions. In Massachusetts, the fundamental purpose of the Workmen's Compensation Act is to give to the employee fair valuation for the loss suffered and to restore him to industry with the least possible delay. This fundamental purpose has been hampered, first, by the limitations in the early provisions of the law relating to medical treatment, and secondly, by the abuses and deficiencies that have grown up under the later provisions, together with inadequate diagnosis and treatment of many conditions by the medical profession. The profession in general has been an active force in fostering and sustaining the true spirit of the law. Its interest and co-operation have always been and still are essential to the success of the administration of the Workmen's Compensation Act.

Section 30 of Chapter 152 of the General Laws

relates to medical treatment, and a résumé of the original law and its amendments may lead to a better understanding of the interpretation and rulings made by the Industrial Accident Board since the Workmen's Compensation Act became effective July 1, 1912.

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The defective feature of this early provision was its failure to accomplish the employee's restoration to industry because of the legal limitations precluding adequate medical treatment. This was an injustice not only to the injured workman but to the physician treating him. These inadequate provisions defeated the salvaging of the employee.

As a second step toward industry's bearing the burden of industrial injuries, provision was made by the legislature to enable the employee to select his own physician. The reasonable cost of the services had to be paid for by the insurer, and these provisions extended the time and scope of the treatment. Where the treatment was ren-

*Presented at the fall meeting of the Massachusetts Medico-Legal Society, October 6, 1937.

Chairman, Massachusetts Industrial Accident Board.

dered by a physician selected by the employee the basis of the dispute was, in general, first, the necessity for the treatment, secondly, the adequacy thereof, and thirdly, the reasonableness of the fee or charge. When the treatment was rendered by a physician furnished by the insurer a dispute seldom arose.

As a third step toward correcting these defective provisions an amendment was passed by the legislature providing that in unusual cases the insurer should furnish adequate and reasonable medical and hospital services. Still the Industrial Accident Board was restricted in its endeavor to accomplish the fundamental purposes of the act. The Supreme Judicial Court, in an opinion rendered by Mr. Justice Carroll, the first chairman of our board, said in the Moore Case (255 Mass. 533, 535): "The statute has reference to injuries which develop unexpected or unusual complications requiring the services of experts or unusual treatment." He added: "The injuries may be unusual in the sense that they do not occur under ordinary circumstances, or that recovery is prolonged. But such facts do not make them unusual cases as the words are used in the statute."

Therefore another amendment was added by the legislature in 1927 to the effect that in cases requiring specialized or surgical treatment for a longer period, in the discretion of the board, the insurer should furnish adequate and reasonable medical and hospital services.

Following this last amendment a meeting was held with our medical adviser, the late Dr. Francis D. Donoghue, and with representatives from the medical profession, the interpretation of the terms "specialized treatment" and "surgical treatment" was agreed upon and accepted by the members of the Industrial Accident Board. "Specialized treatment" was understood to cover cases similar to those requiring sanatorium treatment, namely, treatment of blood diseases such as leukemia, skin conditions, acute, chronic or malignant, neurosyphilis incident to other treatment, and diabetic conditions complicating injuries. It was agreed that such specialized treatment when needed might be given not only by recognized specialists but by qualified general practitioners. "Surgical treatment" should be given in all cases where hospitalization was required or where the period of disability might be shortened or the result of the injury minimized. Such treatment is not necessarily operative. There are many surgical conditions that may be treated by manipulation or by mechanical or therapeutic means. The treatment of lymphangitis, operative cases of contractions, the correction of joint or soft-tissue adhesions, treatment of the results of nerve injuries, genitourinary

treatment, and various forms of heat or ray therapy may well be considered as within the scope of specialized and surgical treatment.

Few cases could fail to fall within this amended section, so that the only remaining question is that of adequacy and reasonableness as the main issues upon which we must make a decision.

Our procedure, in case medical services are not paid for by the insurer and there is no question of liability, is to refer the matter to our medical adviser, who is really a liaison officer between the medical profession and the administrative body. His position is analogous to the old family physician in whom was merged those fundamentals upon which the elaborate specialisms of our day have been built. The medical adviser gives an informal opinion upon the fact, as to the reasonableness of the charges and the necessity of the treatment. If the parties are unwilling to abide by an informal opinion either party may ask for a hearing. After the evidence is taken under oath by a single member a finding is made by the Board.

On superficial examination it would seem advisable to have a fee table. Medical bills for services rendered in industrial accident cases could be handled en masse and a very undesirable angle of the work would thus be eliminated. On the other hand, every case must be reduced to an individual problem. Were it possible to segregate injuries into groups, have a fee table for the physicians and apply a cold scientific treatment to all cases, we should not have a humanitarian law but should be reducing the workman to a robot and the profession to a trade. Some of our medical problems grow out of the type of physician handling the case. Certain doctors look at cases only from the surgical side and do not deal successfully with the patient when the surgical end result has been reached. At this time the patient needs help and encouragement to appreciate that complete recovery is always a gradual process, and that he may experience discomfort which is neither damaging nor incapacitating and requires no medical treatment.

The patient is quick to sense a spirit of intolerance toward him, he suffers discomfort, and naturally seeks a physician who will give him treatment and sympathy. The employee is ignorant of the facts that he needs no treatment and that if he receives it he is being overtreated, incidentally, there is a temptation on the part of some physicians to extend the period of treatment. Even though a surgical end result has been reached and the treatment does nothing but relieve the patient's mind and give him the satisfaction of having something further done for him, is it fur

to rule that such treatment is not necessary and thereby arouse resentment in the mind of the employee?

In determining the necessity and reasonableness of the bill for the services rendered the case must be considered in the light of the facts, which include the mental attitude of the injured man and the experience and qualifications of the physicians who have had contact with the case, as well as the genuineness of the treatment. These are all given a fair evaluation.

Other medical problems present themselves. Take for example a case of hernia. A worker has a pain in his side. This pain brings him to a physician, and when the latter inquires as to the cause, the patient immediately remembers what he was doing when he had the pain. The physician examines him, learns that this was the first pain he has ever had, and advises him that he has a hernia and needs an operation. Assuming this diagnosis to be correct, the legal question arises whether the hernia was caused or aggravated by the incident which happened when the pain first occurred. While traumatic hernias in the true sense of the term are rare, compensable hernias caused by aggravating a pre-existing condition of the groin are exceedingly common. The employee wants the operation but has no money. He has lost no time from his work but has incurred some medical expenses. If the physician really believes that there was a fundamental defect, that this has been changed into one which gives symptoms, and that the incident which the employee describes was sufficient to change the quiescent condition into an active one, he should not hesitate to perform the operation. Controversy will probably develop, and the evidence will be presented to the Board. It is the physician's duty in such a case to appear and testify, and if there has been no impartial examination prior to seven days before the hearing he is entitled to a fee for such an appearance and should request it from the presiding member. If in his opinion the facts suggest not a possibility but a probability, he is unfair to his profession and to society if he fails to co-operate in seeing that industry is charged with this economic loss. On the other hand, if he believes that the facts suggest a mere possibility, he is equally unfair if he does not openly state his opinion and prevent the burden from being placed on industry.

The physician's relation to industry is becoming increasingly important. It is evident that there is a growing need for medicolegal teaching. Our economic structures are becoming more and more

complex. Many industries, in addition to insurance companies, now maintain clinics.

A decision written and handed down by that able jurist, Mr. Justice Lummus of our Supreme Judicial Court, on September 20, 1937, in the case of *McMurdo v. Getter* and another (New Eng. J. Med. 218 402-404, 1938) is of such vital interest to the medical profession that it deserves attention. Just how far this decision may affect the contractual relation between insurers and salaried physicians is uncertain. "The position of the physician merely is not that of a servant of anyone," said the Supreme Judicial Court when the late Oliver Wendell Holmes was chief justice and Knowlton, Morton, Lathrop and Barker were associate justices. The plaintiff had sued a corporation because his disability was alleged to be due to the physician's examination. The corporation had engaged the physician to make the examination for its benefit and information. Mr. Justice Holmes held that the physician "was not an agent or servant of the corporation in making the examination, he was an independent contractor. There is no more distinct calling than that of the doctor, and none in which the employee is more distinctly free from the control or direction of his employer." This case showed that in the eyes of the law a doctor cannot place himself in a position where he is a servant of his employer. The relation of the physician to industry should and must at all times be that of an independent contractor and not that of a servant. "A person cannot do indirectly what he cannot do directly."

It is the duty of the physician to bring the fruits of medical progress to society, and thus to contribute to the welfare of the individual workers and of society as a whole. This field of service is wider than ever before, since new industries are being created and new products manufactured and utilized. The task of the medical specialist is to follow all these developments so as to give warning of the new risks to which workers are exposed, and to indicate the best methods of protection against them. This is a tremendous task. It is the individual en masse who performs work and who likewise suffers trauma. Broken personalities resist restorative measures, and a large number of our disabilities result from them. It is the physician's responsibility to provide adequate measures to restore the diminished productive power. But whatever happens, whatever the future holds for the employee, the medical profession and industry, and even the government, must always remember that the relation of the physician to the employer is that of an independent contractor and not that of a servant.

THREE TYPES OF MECKEL'S DIVERTICULUM

THOMAS F. CORRIGEN, M.D.*

NORTHAMPTON, MASSACHUSETTS

DUE recognition has been given to the fact that the anomaly described by Johann Friedrich Meckel in 1812 and known as Meckel's diverticulum does not always undergo retrogression but abides in varying degrees of persistence and patency. While diverticula are comparatively rare (the literature usually gives an incidence of 1 to 3 per cent at postmortem examination), and rarer in adults than in children, they occur, as Green¹ has shown, with sufficient frequency to warrant careful consideration and to justify detailed reports on individual cases.

Attempts have been made by different authors to classify the various types of diseases of Meckel's diverticulum according to the underlying lesion with the attending syndrome. Greenwald and Steiner² analyzed 51 cases occurring in children under fifteen and divided them into three groups: ulceration with or without perforation, diverticulitis and intestinal obstruction. Greenblatt, Pund and Chaney³ reported 18 cases with an average age of twenty-seven. These fell into six groups: peptic, with or without ulceration, obstructive, diverticulitis, umbilical, tumor and incidental. The following classification was suggested by Chesterman⁴: inflammation with or without ulceration, obstruction, fistula, neoplasms, and associated local abnormalities, such as a mesenteric cyst or enterocystoma.

The three cases reported below, observed within three years, represent characteristic types of Meckel's diverticulum: the bleeding and non-acute, the gangrenous and obstructive and the silent. Discovery of the third type is necessarily incidental. An interesting variation in the first two cases appears in the fact that in one the base of the diverticulum could be left to avert narrowing of the lumen of the bowel, whereas with the obstructive and gangrenous type resection was necessary. In both these cases the previous history showed no indication of the condition, the illness was insidious and its onset sudden, and the response to surgical treatment was prompt and complete.

All three cases were operated on at the Cooley Dickinson Hospital.

Case 1. Bleeding Meckel's Diverticulum (non-acute type). F. K., male, aged 15.

The patient had begun to look pale about 2 weeks before he was examined, and shortly afterward began to suffer intermittent pains in the lower abdomen. Four days be-

fore examination he had diarrhea, passing dark, bloody stools, the bowels continued to be loose, and he vomited several times, once after taking a cathartic and once after eating dinner. For several days he had eaten little, and felt weak, drowsy and cold. The previous history was negative, with the bowels usually regular.

Although he was fairly well developed and well nourished, the patient's color was sallow, the mucous membranes of the lips were markedly pale, and the pulse was rapid and very thready. Except for the abdomen, the physical examination was negative. In the region of the terminal ileum and cecum, the right lower quadrant of the abdomen felt doughy, suggesting a mass. The condition was diagnosed as acute ulcerative ileocolitis or a bleeding Meckel's diverticulum.

The hemoglobin was 38 per cent, there were 1,900,000 red cells and 7050 white cells. The blood was Type O (Landsteiner), the coagulation time was 5 minutes. The urine was normal.

During the first 2 days at the hospital the pulse became stronger and the general condition improved, although there were no bowel movements. There was no pain, but the mass in the right lower quadrant was still present. On the 3rd day a blood transfusion with sodium citrate was attempted. After about 60 cc. of the solution had run into the vein the patient complained of severe pain in the lower abdomen, then became cold, clammy and practically pulseless, and fainted. The transfusion was immediately stopped. The bed was put on blocks, and the patient was given salt solution into the thighs, and morphine. Shortly afterward he had a profuse, bloody bowel movement. The coagulation time was 5½ minutes. He was kept on blocks for the night, and the following day another transfusion was decided upon.

The patient was made ready for a laparotomy, which was performed simultaneously with this second transfusion. Under local anesthesia, a midline incision was made, extending from the symphysis to the umbilicus. On inspection of the small bowel, the patient complained of pain and was given a little gas-oxygen. Examination of the terminal end of the ileum and the cecum disclosed no ulcerative or inflammatory conditions. On examination of the ileum, however, a Meckel's diverticulum was brought into view, situated about 45 cm. from the cecum and lying in the left pelvis. After removal, the diverticulum was found to be completely filled with old blood. The ileum was then sutured. There was no need for resection of the bowel, as a sufficient amount of the base of the Meckel's diverticulum was left so that there was no narrowing of the lumen. During this time, the patient had been given 400 cc. of blood and was later given salt solution by vein.

On the day following the operation, the patient's red cell count was 2,530,000 and the hemoglobin 38 per cent. At no time following the operation was there any blood in the stools. On the 17th postoperative day the red-cell count was 3,879,999 and the hemoglobin 45 per cent. He was discharged on the 27th postoperative day. His general condition when he was last seen was very satisfactory.

Pathologic Report (Dr. F. D. Jones). The diverticulum was 5 cm. in length and 1.5 cm. in diameter at the base,

*Surgeon at Cooley Dickinson Hospital.

there was a constriction 2 cm below the base. The mucosa was yellowish gray in color. Rugae were prominent, except for the narrow band at the constricted portion, where there seemed to be some atrophy. The mucosa consisted of columnar epithelium of the cylindrical type and goblet cells. The other layers were the muscular mucosa, circular and longitudinal muscle fibers and serosa. The blood vessels contained many erythrocytes, and moderate perivascular lymphocytic infiltration was noted. An occasional eosinophil was found in the submucosa.

Case 2 Gangrenous Meckel's Diverticulum and Compression Obstruction of the Ileum R. A., male, aged 19

The patient awoke at 3 a. m. with a violent pain generalized over the entire abdomen. He became nauseated and vomited greenish yellow fluid, the vomiting recurring several times during the day. He continued to suffer pain, which became localized after a few hours in the lower right quadrant, extending from the midline to the flank, the maximum intensity being about 5 cm. below and medial to McBurney's point. By the time of his arrival at the hospital later in the morning, the pain had again become general and was very severe. Examination revealed some distention of the upper portion of the abdomen, with no spasm or rigidity under pressure. In the lower abdomen, palpation over the right side elicited some tenderness, but there was no marked muscle spasm. The chief complaint seemed to be centered about the umbilicus. A diagnosis of probable acute appendicitis was made, with another physician disagreeing.

The previous history included chorea at the age of 6 or 7, and measles, scarlet fever, mumps and whooping cough in childhood. Two or three months before admission he had awakened from a sound sleep suffering a sharp general pain in the abdomen. This had lasted only a moment or two and had not recurred until the present. He had been very active and healthy and had not had any digestive disturbances. In the physical examination the eyes, ears, nose and throat were negative, the chest was normal, and there were no heart murmurs.

When the abdomen was opened by a right rectus incision, free blood was found. The appendix appeared normal. When the right hand was placed in the pelvis a great deal of free blood welled up. With the enlargement of the incision toward the midline, several loops of the small bowel were found to be absolutely flat. In following up the ileum, a large mass was disclosed. This was a strip of gangrenous material approximating 4 cm at the base and coming off from the cecum, which had curved over and had completely encircled one loop of gut. The proximal portion of this loop was markedly distended and reddened. The gangrenous area had extended through the mesentery of the loop and through the mesentery of the original loop of ileum to which it was attached, so that it completely encircled both the loop of the small bowel and the loop of ileum which was its original attachment. The Meckel's diverticulum was about 17 cm long. The distal portion of the diverticulum was freed and drawn through the two openings in the mesentery. With the loosening of the distal portion, the bowel immediately assumed its normal condition. A resection of the gut was then done, in order to remove the gangrenous portion of the bowel along with the diverticulum. The postoperative course of the patient was uneventful, and within 13 days he had made a very satisfactory convalescence.

Case 3 Silent Meckel's Diverticulum and Gangrenous Ovarian Cyst M. G., female, aged 43

One week after a normal menstrual period, the patient suffered a sudden, sharp, severe pain in the lower left pel-

vis. For 5 days she continued to suffer pain, from which repeated enemas brought no relief. On the 5th day she consulted a physician and was sent to the hospital. Seven months before, there had been a gradual increase in the size of the lower abdomen, particularly on the left, but until the present illness she had suffered no discomfort.

Except for the abdomen and for slight rapidity of inspiration and expiration, physical examination was negative. The abdomen was markedly distended. The outline of a mass could be seen over the left lower quadrant, extending from about the midline over the entire left pelvis and up to about the level of the umbilicus. Rectal examination gave the impression of a definite, rounded, smooth mass about the size of a large grapefruit. This mass was extremely tender to the touch, and during the examination the patient complained of considerable pain.

The red cells numbered 4,560,000 and the white cells 21,000, with 90 per cent polymorphonuclears.

A midline incision was made from the symphysis to the umbilicus. Upon opening the abdomen, some dark red blood was found free in the peritoneal cavity. As preparation was being made for walling away the large, black and gangrenous cyst of the ovary, which had been readily found, a definite Meckel's diverticulum came up into the wound. The diverticulum was about 45 cm from the cecum, and its walls were much thinner than the walls of the ileum. It contained no fecal matter but was distended with gas, as was practically all the small bowel. The cyst and diverticulum were removed without difficulty. The patient had an uneventful convalescence.

Pathologic Report (Dr F. D. Jones) The diverticulum measured 4 cm in length and 1.8 cm. in diameter. The serous surface was pink. The wall was 4 mm. in thickness, and the well-differentiated mucosa was gray, glistening and velvety. The diverticulum was pear shaped, with the largest diameter at the base. The mucosa was made up of glands in which numerous goblet cells were found. These glands were closely packed in a delicate stroma. The normal muscular coat of the intestine was present.

The symptomatology of a diseased Meckel's diverticulum depends on the pathologic changes that have taken place. In order of frequency, the symptoms associated with hemorrhage from the rectum, according to Chesterman,⁴ are anemia, pain, vomiting and bowel irregularity. The blood is usually dark, unmixed with mucus or pus. Greenwald and Steiner² noted in the peptic type without perforation, hemorrhage, abdominal pain, nausea and vomiting and weakness. There may be no abdominal signs, or there may be tenderness, either on the right or left, and in some cases a palpable mass. Radiological examination is usually negative. Secondary anemia may be severe.

Diagnosis is usually made by a process of exclusion. Between the ages of five and fifteen, melena is unusual and should suggest the possibility of a Meckel's diverticulum.

The above symptom-complex is illustrated in Case 1. Pathological examination, however, revealed no evidence of ulceration. Chesterman⁴ has discussed the etiology of hemorrhage and states that very few cases have been recorded of un-

doubted hemorrhage from diverticula which showed no signs of either aberrant mucosa or ulceration. He believes that recurrent inflammation of a hemorrhagic nature may be the cause.

Obstruction, either of the bowel or of the diverticulum itself, may be caused by bands or adhesions, by intussusception or volvulus, by coils of the ileum wrapped around the diverticulum or, as in Case 2, by the diverticulum being coiled around the intestine.

In the series described by Greenwald and Steiner,² obstruction occurred in 15 of the 51 cases. In 9 the obstruction was due to the presence of bands, in 5 to intussusception, and in 1 the ileum had become wrapped around the diverticulum. Seven of the 18 cases reported by Greenblatt, Pund and Chaney³ developed partial to complete intestinal obstruction, 2 of these were due to intussusception and 1 to volvulus. In cases of this type the onset is usually acute, with abdominal pain, nausea and vomiting. Infrequently there is a history of intestinal bleeding.

The gangrenous condition of the diverticulum, with free blood in the abdomen, as found in Case 2, suggests that here we may have a combination of diverticulitis with perforation and intestinal obstruction.

In the majority of instances, however, Meckel's diverticula give no symptoms but are discovered by chance during abdominal operations or at autopsy. Case 3 represents this passive or incidental type.

Treatment is invariably surgical. When hemorrhage has occurred, transfusions should be given to combat anemia. When found in the course of an operation a "silent" diverticulum should be removed, as pathologic changes may develop.

SUMMARY

Several classifications of the types of diseases of Meckel's diverticulum as reported in the literature are presented.

Cases illustrating three important types—the hemorrhagic, the obstructive and the silent—are presented, and the operative procedures described. Symptoms and diagnosis are discussed.

16 Center Street.

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SULFANILAMIDE IN THE TREATMENT OF GONORRHEA IN THE FEMALE

BURTON C GRODBERG, MD,* AND EDMUND L CAREY, MD†

BOSTON

IN the out-patient department of the Boston City Hospital we have an excellent opportunity to study gonorrhea in the female. All the cases included in this study have been treated with sulfanilamide. Harvey and Janeway, Young, Helmholz and Osterberg have pointed out that, in doses of 80 gr daily, it is a dangerous agent. Being faced with its unknown toxicity, we decided from the outset to utilize smaller doses over a longer period. We have prescribed an average daily dose of from 20 to 30 gr for a four- to six-week period. No intramuscular injections have been given. The drugs used have been Prontylin and Stramid, both products of reputable houses.

In every case we have demonstrated the gonococcus intracellularly in smears of the exudate

stained by Gram's method. The smears have been taken from the urethra, the cervix or the region of Bartholin's glands, both for diagnosis and as a criterion for cure. We have not utilized cultures, nor have we routinely included the complement-fixation test.

Each patient, after the diagnosis had been established, was informed of her disease and given definite instructions. The drug was furnished by the Massachusetts Department of Public Health and at each visit dispensed through our Social Service Department. This treatment was the only one utilized, and the patients were told not to take medicated douches except in special cases. Originally these patients were seen three times a week, but later this was changed to weekly visits. They were advised to refrain from coitus and the use of alcohol. The usual public-health measures to prevent extragenital spread were carried out. In this series we have excluded cases of the chronic type and acute cases which did not have a positive

Read before a meeting of the New England Obstetrical and Gynecological Society at the Boston City Hospital December 1 1937.

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smear, but the latter have been treated with results similar to those reported in this study

The type cases have been acute endocervicitis, acute urethritis, vulvovaginitis, both adult and juvenile types, and acute pelvic inflammatory disease. We have treated a few patients in various stages of pregnancy. Our experience has been the same as that of Kenny, Johnston, von Haebler and Miles, who found no exaggeration of pre-eclamptic symptoms in their cases of pyelitis of pregnancy following treatment with sulfanilamide.

The characteristic course of our patients has very closely simulated that of Cook and Buchtel, Helmholz and Osterberg, Reuter and Orr, who used the larger doses, the only difference being a slightly slower response in our cases. We found

(1) In less than one week, usually about three to four days, there was subjective improvement. Patients reported diminishing discharge and those who had had pain stated that it decreased and soon ceased.

(2) The smears taken at about one week after the onset of medication showed fewer gonococci, with the organisms situated extracellularly.

The drug was also ineffective in the majority of cases of infantile vulvovaginitis, utilizing both topical and oral sulfanilamide medication, this was true in spite of doses approximating by weight those of other observers. Long and Bliss contend that sulfanilamide is most efficacious in an alkaline medium. Our failure with topical application may be attributed to the fact that the vagina is notoriously acid, however, we did not supplement oral medication with alkalis in our successful adult cases. In the future we may follow another series topically and orally, with the additional administration of alkalis.

The juvenile patients in whom there was no response to sulfanilamide showed excellent results with daily Amniotin suppositories of 2000 rat units, with a total dosage of 24,000 to 36,000 units.

Contrary to the experience of Archer and Discombe, Cook and Buchtel, Helmholz and Osterberg, and Brunsting, we have had a minimum of toxic manifestations. In no case were we forced to discontinue the drug because of their appearance. There were 4 adults who complained of giddiness and nausea, but no case of cyanosis. In the children, when the dosage was raised, we

Table 1 Summary of Results, Dosage and Duration of Treatment

DIAGNOSIS	No OF CASES		AVERAGE DAILY DOSE Sulfanilamide	AVERAGE DURATION OF TREATMENT	AVERAGE FOLLOW UP PERIOD	AVERAGE No OF NEGATIVE SMEARS IN CURED CASES
	TOTAL	CURED				
Acute pelvic inflammatory disease	15	13 (87%)	8T	7MO	7MO	4
Acute endocervicitis	8	7 (88%)	28	1½	2½	5
Acute urethritis and endocervicitis	3	2 (67%)	24	1½	3	4
Bartholinitis	1	1 (100%)	27	1½	2	6
Vulvovaginitis (infantile)	5	1 (20%)	20	1½	2	3
			8	2½	3½	2
Totals (excluding infantile cases)	21	23 (85%)				
Averages (excluding infantile cases)			26	1½	2½	4

(3) The purulent nature of the smear continued, but in from seven to ten days gonococci were absent.

(4) The discharge shortly thereafter became mucoid, and no pus cells were seen on examination.

(5) Acute masses, both tubo-ovarian and vulvovaginal, resolved in about ten to fourteen days. (One of our pregnant cases had a Bartholin gland in which infection was definitely increasing, in three or four days following the onset of medication this became painless, and in less than two weeks was no longer palpable.)

(6) The cervix lost its acute inflammatory appearance and the discharge ceased. (Those cervixes which were eroded with ectropion were treated as chronic endocervicitis, at first with depletion douches and glycerin tampons and later with cauterization to control the local lesion.)

We used topical applications of Prontosil in a few of our early cases, with no improvement

observed two skin rashes similar to those described by Brunsting and by Schwentker and Gelman. These were vesicopapular, itchy and limited largely to the hands, face and legs—all exposed surfaces.

Our criteria for cure were as follows:

(1) At least three negative smears, both from cervix and urethra, at weekly intervals (at least one was either pre- or post-menstrual).

(2) Absence of any symptomatology or clinical signs, such as discharge, pain, injection, inflammatory masses, or pain on movement of the cervix and uterus.

In all, we have included in this preliminary series 32 cases. We have double this number which we have excluded either for failure to conform to our criteria or to continue treatment. The former group has shown as good a clinical response as those we are discussing.

There were 85 per cent cures in our adult group (Table 1). These figures compare well

with the 87.5 per cent reported by Orr, the 80 per cent reported by Brown and Bannick and the similar percentage of Dees and Colston. Many of the cases reported by these authors, however, occurred in men, and all observers report a lower percentage of cures in women. In the juvenile type of vulvovaginitis only 1 case (20 per cent) was successfully treated with sulfanilamide. This compares favorably with the results of Hageman and Blake, who report 1 cure in 3 patients.

As yet we have had no relapses and it is too early to consider recurrences.

SUMMARY

A series of 32 cases of gonorrhea in women has been treated with relatively small doses of sulfanilamide. Although the percentage of cures may be slightly less than that reported following the use of larger doses, this fact is compensated for by the absence of toxic manifestations.

We are indebted to Miss Mary Parker and Miss Gladys Madoff of the Social Service Department, and Miss Marion Johnson, our technician, for their co-operation in this study.

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THE MASSACHUSETTS MEDICAL SOCIETY

PROCEEDINGS OF THE COUNCIL

Annual Meeting, June 1, 1938

THE annual meeting of the Council of the Massachusetts Medical Society was called to order by the president, Channing Frothingham, Suffolk, in the Penthouse of the Hotel Bradford, Boston, on Wednesday morning, June 1, at 10.30 o'clock. There were 234 councilors present, the list will be found in Appendix No 1.

The Secretary presented the minutes of the last meeting (February 2, 1938) as published in the *New England Journal of Medicine*, issue of March 17, 1938. After the usual query concerning corrections or additions, the President declared the records approved as published.

The following obituaries of the four councilors who had died since the last meeting were read by the President.

Dr John S Leard, of West Roxbury, died at his home, February 3, after a week's illness. He was in his seventy second year.

A native of Prince Edward Island, he graduated from Prince of Wales College and received his degree from the University of Pennsylvania School of Medicine in 1894.

Dr Leard was a member of the original staff of the Faulkner Hospital and was organizer and first president of the West Roxbury-Roslindale-Jamaica Plain Medical Association. He was a fellow of the American Medical Association. At the time of his death he was vice president of the Jamaica Plain Dispensary and a member of the Clinical Club of Boston and of the Norfolk District Medical Society, of which he was a past president, councilor and censor.

His widow, a daughter and twin sons survive him.

Dr Arthur R. Crandell died at his home in Taunton, March 19. He was in his sixty ninth year.

A native of Taunton, he attended the high school there, later graduated from Harvard University and received his degree from the Harvard Medical School in 1896. Since 1900 he had been consulting physician at the Morton Hospital in Taunton. He was a fellow of the American Medical Association. His memberships included the New England Pediatric Society and the Taunton Doctors Club. Dr Crandell was a councilor and supervising censor of the Massachusetts Medical Society for many years.

His widow, a daughter, a sister and three grandchildren survive him.

Dr William D Walker, of Andover, died April 12. He was in his sixty first year.

A native of St. John, New Brunswick, he was the son of Dr Thomas Walker, physician-surgeon and colonel of the 62d regiment of Canadian militia. He received his degree from Tufts College Medical School in 1905. He served as school physician at Andover for many years and was on the school committee for six years.

Dr Walker was a fellow of the American Medical Association and a member of the Lawrence Medical Club.

At the time of his death he was president of the Essex North District Medical Society.

Dr Francis M McMurray, of Fitchburg, died at his home May 8. He was in his sixty sixth year.

Born in Merrimack, he attended the Fitchburg High School, graduated from Brown University and received his degree from the New York University College of Medicine in 1899.

Dr McMurray was president of the staff at the Burbank Hospital for many years and had been chief anesthetist at the hospital for several years. He was a fellow of the American Medical Association and was a past president of the Worcester North District Medical Society and its secretary at the time of his death.

His widow, a daughter and a brother survive him.

The councilors stood in silent tribute.

After the roll call of the nominating councilors, the following-named gentlemen retired to consider the nomination of officers and orator for the ensuing year.

W D A Kinney, *Barnstable*, H J Downey, *Berkshire*, W H Allen, *Bristol North*, E F Cody, *Bristol South*, F W Snow, *Essex North*, J F Jordan (alternate), *Essex South*, W J Pelleter (alternate), *Franklin*, G L Schadt, *Hampden*, L N Durgin, *Hampshire*, R R Stratton, *Middlesex East*, F D Lambert, *Middlesex North*, A W Dudley, *Middlesex South*, W A Griffin, *Norfolk*, C A Sullivan, *Norfolk South*, W H Pulsifer, *Plymouth*, E P Joslin (special alternate), *Suffolk*, R P Watkins, *Worcester*, and E A Adams (alternate), *Worcester North*.

There being no alternate from Suffolk to cover the absence of Dr Lahey, the chair obtained permission of the Council to appoint Dr Elliott P Joslin as alternate from Suffolk.

REPORTS OF STANDING COMMITTEES

Membership and Finance

The chairman, Dr David N Blakely, Norfolk, presented the report of his committee which recommended that seven fellows be allowed to retire, that the dues of two fellows be remitted, that ten fellows be allowed to resign and that nine fellows be allowed to change membership from one district society to another without change of legal residence. The report was accepted and the recommendations approved. (See Appendix No 2.)

The financial part of the report by Dr Blakely recommended that the surety bond of the Treasurer in the amount of \$15,000 be renewed for one

year from June 19, 1938. This report was likewise accepted and the recommendation approved.

Although not properly a part of the report of the Committee on Membership and Finance, action on the restoration of fellows and the appointments of committees to consider applications for restoration were included at this point.

The Council approved of the recommendations of committees previously appointed to consider petitions for restoration to the privileges of fellowship of nine applicants. (See Appendix No 3.)

The Council approved of the committees nominated by the President to consider petitions for restoration to fellowship which had been received from eleven fellows previously deprived. (See Appendix No 4.)

Ethics and Discipline

This report, which was presented by the chairman, Dr. David Cheever, Suffolk, and which contained no recommendations, was accepted by the Council. (See Appendix No 5.)

At the close of his report Dr. Cheever announced his resignation from the committee. The Council expressed its appreciation of the long and faithful service rendered by him on this committee by a spontaneous outburst of applause.

Medical Education and Medical Diplomas

In the absence of the chairman, Dr. Fitz, the report was read by Dr. Charles A. Sparrow, Worcester. (See Appendix No 6.) There being no recommendations in the report, it was duly accepted by the Council.

State and National Legislation

The chairman, Dr. Charles C. Lund, Suffolk, presented an informal report in which he reviewed the work of the committee for the past year. He pointed out that, while one hundred per cent success had not attended the committee's efforts, most of the major issues had been acceptably handled. The Legislature did, however, extend until 1941 the provisions of the law previously enacted which sets up an approving authority to scrutinize all medical schools graduating individuals who subsequently apply for licensure. He reported that the osteopathic and chiropractic bills, together with bills designed to improve the dispensing of drugs and poisons, were placed in the hands of a recess commission of the Legislature. The committee does not know the final form which the legislation will take. He commented upon the work of the committee in carrying out the instructions given by the Council at its meeting on February 2, 1938, which were designed to support Dr. Henry D. Chadwick for reappointment as commissioner of public health. He reported that, while one nomination had been made by the Governor, it had not been

confirmed by the Governor's Council and that no subsequent nomination had yet been made.

He stated that the committee was doing all in its power to persuade the Legislature to pass a reasonable bill looking toward the reorganization of the Department of Mental Diseases. It is the hope of the committee that action by the Legislature may be postponed until the next annual session in order to permit further study during the summer and fall.

In the opinion of the committee there were certain parts of the bill to regulate the practice of nursing which were admirable but, as the bill had been hurriedly drawn, it needs further study, and the committee seeks to have this study conducted by a recess commission during the coming summer.

Under the heading of national legislation, the chairman referred to a bill (H. R. 4650) which had passed the House and Senate and which extends medical privileges to osteopathic physicians. He stated that the *Journal of the American Medical Association* had recently published an editorial on the matter and, from the information received, it appears that the Senate had passed the bill as a result of deliberate misrepresentation by the proponents which implied that the provisions of the bill had met with the approval of organized medicine. The committee recommended that the Council pass a resolution to be sent by telegraph to President Roosevelt requesting that the bill be vetoed.

The chairman expressed the opinion that certain of the legislators believe that the Massachusetts Medical Society is ultraconservative and does not co-operate in efforts made to abolish various abuses. In his opinion the Society should do what it can to facilitate the work of various state departments by supporting proper legislation.

Dr. Lund paid his respects to Dr. Arthur W. Marsh, Worcester, who had submitted his resignation from the committee after a long period of faithful and effective service. He commented upon the organization perfected by Dr. Marsh in his district and submitted it as an inspiration to the other district societies. The committee also extended its thanks and appreciation to the members of the district legislative committees for the service that they had rendered during the past year. The report of the committee was duly accepted. The specific recommendation was that the following telegram be sent to President Roosevelt over the signature of the president of the Massachusetts Medical Society:

At its annual meeting, the Council of the Massachusetts Medical Society voted unanimously to urge you to veto H. R. 4650. This bill would give osteopaths standing that they do not now have and would be, in our considered opinion, detrimental to the best interests of the public.

The recommendation was duly approved.

Public Health

The report by the chairman, Dr Robert B Osgood, Suffolk, was duly accepted (See Appendix No 7) The joint resolution presented in the report had been referred to the Section of Obstetrics and Gynecology and the Council was informed that the Section had taken favorable action

Medical Defense

The report of the committee by the chairman, Dr Franklin G Balch, Suffolk, was duly accepted (See Appendix No 8)

REPORTS OF SPECIAL COMMITTEES

Postgraduate Instruction

The report by the chairman, Dr Frank R Ober, Suffolk, was duly accepted (See Appendix No 9) The committee's recommendation that the Society continue to co-operate with government agencies in giving extension postgraduate instruction was duly approved by the Council The recommendation that the Massachusetts Medical Society sponsor a Clinical Congress was discussed in some detail and was finally approved and the committee instructed to work out the details

Public Relations

The report was presented by the secretary, Dr Elmer S Bagnall, Essex North (See Appendix No 10) Dr Bagnall referred to what has come to be known locally as the Lane Resolution but which is in fact a resolution presented to the House of Delegates of the American Medical Association by the delegates from Ohio at the annual meeting in 1937 It was stated that this resolution has been adopted by eighteen states After some discussion, in which it was pointed out that the acceptance of the report did not carry with it approval of the recommendations contained therein, the report was finally accepted by the Council

Dr Lane moved to substitute the original resolution submitted by him for Recommendation No 1 made by the committee. The resolution follows

RESOLVED, That we approve the prepared hospital plan with the stipulation that the contract benefit provided by group hospitalization insurance shall be limited to hospital accommodations such as room, bed, board, operating room facilities and general nursing care ordinarily provided by hospitals, routine drugs, and the routine services of interns only when acting under the direction of the attending physician, and that except as stated above, the contract shall not include the services of physicians either general or special.

There was discussion by Dr Walter A Lane, Norfolk, Dr Albert A. Hornor, Suffolk, Dr Frank H Lahey, Suffolk, Dr Michael A Tighe, Middlesex North, Dr Leroy E Parkins, Suffolk, and Dr Charles J Kickham, Norfolk The Presi-

dent then called for a vote and announced that Dr Lane's motion was lost.

Recommendation No 1 in the report was next presented The recommendation was adopted without opposition

The second recommendation was then presented and was finally adopted in the following modified form

WHEREAS, This report leaves unsolved the important question of what constitutes desirable service by a hospital, be it

RESOLVED, That the Council refer this question to the Committee on Public Relations for study and for report at the next annual meeting of the Council, and that the Council further recommends that the organized anesthetists, roentgenologists and pathologists take up with the Hospital Council of Boston and the New England Hospital Association certain very important and fundamental problems in medicine related to this discussion with the hope of reaching a decision which will be mutually agreeable to hospitals and organized medicine.

The third recommendation was then presented and was finally divided into two parts first, "that the Council approve the survey the American Medical Association is making on the adequacy of medical care" After considerable discussion, in which Dr Michael A Tighe, Middlesex North, Dr Frank H Lahey, Suffolk, and Dr John P Monks, Suffolk, took part, the Council voted to approve of this part of the recommendation

The second part of the third recommendation, namely "that the Massachusetts Medical Society accept responsibility for the proper analysis and tabulation of the material collected by the district societies" was referred to the Committee on Membership and Finance (This recommendation was subsequently referred to the newly appointed Committee on Financial Planning and Budget.)

Insurance Relations

From the report by the chairman, Dr William G Curtis, Norfolk South, it appears that this committee continues to function in its endeavor to promote better relations among the insurance companies, the hospitals and physicians There was a joint meeting of presidents and secretaries from certain district medical societies, together with hospital and insurance executives, held at the Chamber of Commerce building on Monday, March 21, 1938 The entire arrangement, as previously presented, was discussed in detail Apparently the majority of the participants were pleased with the progress which has been made The meeting was in charge of a committee composed of Dr William G Curtis, Dr George A MacIver, Mr James H Holland and Mr Richard J Dunn It was evident that the work of Dr Henry M Landesman, the secretary of the committee, had been most effective The report was accepted as one of progress

Physical Therapy

The report by the chairman, Dr Franklin P Lowry, Middlesex South, was accepted by the Council (See Appendix No 11)

ELECTION OF OFFICERS

The senior member of the nominating councilors presented the following list of candidates for election as officers and orator of the Massachusetts Medical Society for the ensuing year

For president Channing Frothingham, Boston.
For vice president A. Warren Stearns, Billerica.
For secretary Alexander S Begg, West Roxbury
For treasurer Charles S Butler, Boston.
For orator Elliott P Joslin, Boston.

The President asked if there were any other nominations from the floor There being none, Dr Lane, Norfolk, moved that, under suspension of the rules, the Secretary be directed to cast one ballot for the list as nominated by the nominating councilors The motion was duly seconded and, there being no discussion, the question was put and the Council voted to elect the officers and orator as nominated The President then declared that the officers and orator for the ensuing year had been duly elected

The standing committees for the ensuing year were nominated by the President as follows

COMMITTEE ON PUBLICATIONS

R. I Lee, *chairman* R. M. Smith, F. H. Lahey,
J. P. O'Hare, Conrad Wesselhoeft.

COMMITTEE OF ARRANGEMENTS

R. P. Stetson, *chairman* Augustus Thorndike, Jr.,
E. J. O'Brien, Jr., W. T. O'Halloran, J. A. Halsted

COMMITTEE ON ETHICS AND DISCIPLINE

R. L. DeNormandie, *chairman* C. J. Kickham,
R. R. Stratton, W. J. Brickley, A. G. Rice

COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS

Reginald Fitz, *chairman* E. S. Calderwood, A. W. Stearns, A. R. Gardner, G. D. Henderson

COMMITTEE ON STATE AND NATIONAL LEGISLATION

C. C. Lund, *chairman* B. F. Conley, A. M. Butler
C. A. Robinson, D. L. Lionberger, *secretary*

COMMITTEE ON MEMBERSHIP AND FINANCE

H. Q. Gallupe, *chairman*, G. C. Caner, J. E. Fish,
H. F. Newton, P. H. Leavitt

COMMITTEE ON PUBLIC HEALTH

R. B. Osgood, *chairman* Gerald Hoeffel, S. C. Dalrymple, H. L. Lombard, F. P. Denny

COMMITTEE ON MEDICAL DEFENSE

F. G. Balch, *chairman*, E. D. Gardner, F. B. Sweet,
A. W. Allen, W. R. Morrison

COMMITTEE ON PERMANENT HOME

W. H. Robey, *chairman* C. G. Mixter, J. M. Birnie,
C. S. Butler, E. C. Miller

In each instance Dr Frothingham called for additional nominations, and there being none, each committee was declared appointed On motion of Dr Charles E. Mongan, Middlesex South, duly seconded, the Secretary was instructed to write a letter of appreciation to those men who have retired as chairmen of standing committees and who have served the Society so long and faithfully in this important work

PRESENTATION OF CHANGES IN THE BY-LAWS

These were duly presented as shown in the report of the annual meeting of the Society It will be noted that Amendment No 1 is designed to cover the provisions included in a resolution introduced by Dr Alexander A. Levi, Middlesex South, and adopted by the Council June 2, 1937 Amendments No 2 and 3 were introduced by Dr John M. Birnie, Hampden, for the purpose of uniformity in methods of procedure Amendments No 8 and 9 were presented by the committee of recent presidents appointed by the Council at its meeting February 2, 1938 Dr Mongan, Middlesex South, presented a minority report but withdrew the report when the amendments were altered as subsequently published

INCIDENTAL BUSINESS

The action of the Board of Censors of Bristol South District in examining and admitting to fellowship the following-named individuals was confirmed by the Council. These names were received too late for inclusion in the list published in the *New England Journal of Medicine* for April 21, 1938

Filbert Avila Silveira, Jr., St. Luke's Hospital, New Bedford Boston University School of Medicine, 1937

Manuel Ferreira Sousa, St. Luke's Hospital, New Bedford McGill University Faculty of Medicine, 1937

The President announced that he was in receipt of a communication submitted by Dr Henry M. Landesman, Norfolk, recommending that some action be taken to encourage members of the profession to submit to a thorough annual physical examination under proper auspices The President announced that the communication would be referred to the Committee on Public Relations

The President read the following communication from the Hampden District Medical Society

The Hampden District Medical Society at its annual meeting on April 26, 1938, disturbed by the lack of common policy and action within the various districts of the Massachusetts Medical Society regarding graduates of unrecognized medical schools, urges that the Council at its next regular meeting take steps to remedy this situation.

Voted, that the Hampden District Medical Society convey the above to the Council of the Massachusetts Medical Society

H. L. SMITH, *Secretary*
Hampden District Medical Society

The meeting adjourned at 1.35 p m and was followed by the Cotting Luncheon

ALEXANDER S BEGG, *Secretary*

APPENDIX NO 1

ATTENDANCE

BARNSTABLE

M E. Champion
D E. Higgins
W D A. Kinney

FRANKLIN

F J Barnard
H M. Kemp
W J Pelleuer

BERKSHIRE

J J Boland
I S F Dodd
H J Downey
John Hughes
Solomon Schwager
P J Sullivan

HAMPDEN

F H. Allen
T S Bacon
E. P. Bagg
J M Birnie
W A. R. Chapin
J L. Cbereskin
A J Douglas
G L. Gabler
P E Gear
Frederic Hagler
G D Henderson
E. A. Knowlton
M W Pearson
A G Rice
G L. Schadt
H L. Smith
G L. Steele

BRISTOL NORTH

H. L. Rich
W H. Allen
F H. Dunbar
F V Murphy
E. P. Seaver, Jr
G W Blood
R. B. Butler
E F Cody
E. D. Gardner
H E. Perry
D D Pratt
I N. Tilden
P E. Truesdale

HAMPSHIRE

L. N. Durgin
J D Collins

MIDDLESEX EAST

R. W. Sheehy
J H. Blaisdell
L. M. Crosby
Richard Dutton
E. M. Halligan
J H. Kerrigan
K. L. MacLachlan
R. R. Stratton

ESSEX NORTH

E S Bagnall
R. V. Baketel
C S Benson
J F Burnham
Z. W. Colson
H. F. Dearborn
H. R. Kurth
G L. Richardson
F W. Snow
L. T. Stokes

MIDDLESEX NORTH

C. M. Roughan
A. R. Gardner
F D Lambert
G A. Leake
T A. Stamas
M. A. Tighe

ESSEX SOUTH

H. A. Boyle
N P Breed
C L. Curtis
J F Donaldson
R. E. Foss
S E. Golden
R. P. Hallett
J F Jordan
B B Mansfield
A. E. Parkhurst
W G Phippen
J W Trask

MIDDLESEX SOUTH

F R. Jouett
C. F. Atwood
E. W. Barron
C. F. h. Bean
E. H. Bigelow
G F H. Bowers
W S Burrage
E. J. Butler

B F Conley
D F Cummings
C H Dalton
H F Day
J E Dodd
D C Dow
A. W. Dudley
H. Q. Gallupe
F W Gay
H G Giddings
H. W. Godfrey
W G Grandison
A D Guthrie
F A Higginbotham
N M Hunter
A. M. Jackson
A A. Levi
F P Lowry
R. A. McCarty
J A. McLean
Edward Mellus
C E. Mongan
J P. Nelligan
E J O'Brien
Dwight O'Hara
Max Ratto
E. S. A. Robinson
E. J. Sawyer
M. J. Schlesinger
E. F. Sewall
E. W. Small
H. P. Stevens
R. A. Taylor
H W Thayer
Fresenius Van Nüys
M. W. White
W S Whittemore

NORFOLK

D D Scannell
J D Adams
F G Balch
A. S. Begg
M. I. Berman
D N. Blakely
Myrtelle M. Canavan
A H. Ehrenfried
D G Eldridge
H. M. Emmons
C. B. Faunce
J F Ford
Morris Frank
L. M. Freedman
Maurice Gerstein
W A. Griffin
H. L. Johnson
C J Kichham
E. L. Kichham
H. M. Landesman
W A. Lane
D L. Lionberger
F P McCarthy
W H. McMan
H. C. Petterson
A. T. Ronan
M. V. Safford
J A. Seth
F J Simmonds
H. F. R. Watts
S H. Weiner

NORFOLK SOUTH

N R. Pillsbury
C. S. Adams
W G Curtis
H. A. Robinson
C. A. Sullivan

PLYMOUTH

B H. Peirce
J E. Brady
Jacob Brenner
H. A. Chase
A. L. Duncombe
S W. Goddard
H. H. Hamilton
D W. Pope
W H. Pulsifer
H. C. Reed

SUFFOLK

J W Bartol
Walter Bauer
H. L. Blumgart
W B Breed
W E. Browne
C. S. Butler
David Cheever
H. M. Clute
Lincoln Davis
A. B. Donovan
G B Fenwick
Channing Frothingham
M. N. Fulton
Joseph Garland
John Homans
A. A. Hornor
Rudolph Jacoby
E. P. Joslin
H. A. Kelly
F H. Lahey
T H. Lanman
C C. Lund
L. S. McKittrick
J V. Meigs
W J. Mixer
J P. Monks
N A. Nelson
R. N. Nve
J P. O'Hare
R. B. Osgood
L. E. Parkins
Helen S Pittman
W H. Robey
R. M. Smith
E. F. Timmins
S N. Vose
I J. Walker
Shields Warren
Conrad Wesselhoeft
C. F. Wilinsky

WORCESTER

C. A. Sparrow
W P. Bowers
P H. Cook
G A. Dix
E. B. Emerson
G E. Emery
J M. Fallon
J J. Goodwin

E. L. Hunt	R. P. Watkins
E. R. Leib	S. B. Woodward
W. F. Lynch	
A. W. Marsh	WORCESTER NORTH
J. W. O'Connor	F. P. Moore
W. C. Seelye	E. A. Adams
G. C. Tully	C. B. Gay
R. J. Ward	A. F. Lowell
F. H. Washburn	

APPENDIX NO 2

REPORT OF THE COMMITTEE ON MEMBERSHIP
AND FINANCE ON MEMBERSHIP

This committee recommends

1 That the following named seven fellows be allowed to retire under the provisions of Chapter I, Section 5, of the by laws

Canedy, Frederick Snow, Wellfleet, with remission of dues, 1938

Drake, Arthur Knowlton, Toulon, Illinois, with remission of dues, 1938

Hanson, Justus Greeley, Northampton, with remission of dues, 1938

Johnson, Frederick William, Boston.

Moir, Marguerite Winifred, West Roxbury, with remission of dues, 1935, 1936, 1937, 1938

Robbins, Fred Gibson, Boston.

Woodbury, Sullman Philetus, Millers Falls, with remission of dues, 1938

2. That the dues of the following named two fellows be remitted under the provisions of Chapter I, Section 6, of the by laws

Bond, Katherine Marie Erickson, Stoncham, 1937

Staples, Clarence Hathorne, Malden, 1938

3 That the following named ten fellows be allowed to resign under the provisions of Chapter I, Section 7, of the by laws

Crittendon, George Alanson, Springfield, with remission of dues, 1936, 1937, 1938

Downing, Francis Harold, Fresno, California, with remission of dues, 1938

Gundersen, Sven Martin, Hanover, New Hampshire, with remission of dues, 1938

Hannaford, Charles William, Portsmouth, New Hampshire.

Monette, Camile Joseph, Manchester, New Hampshire, with remission of dues, 1938

Rapoport, Boris David, New York City, with remission of dues, 1938

Strong, Paul Theodore, Mount Herman, with remission of dues, 1938

Sullivan, Charles Noyes, New Britain, Connecticut, with remission of dues, 1938

Gobert, Solomon, Everett.

Weissman, Ruth, Boston, with remission of dues, 1938

The last two fellows, Drs Gobert and Weissman, submitted their resignations on request of the Committee on Ethics and Discipline under the provisions of Chapter VII, Section 4, of the by laws.

4 That the following named nine fellows be allowed to change their membership from one district society to another without change of legal residence, under the provisions of Chapter III, Section 3, of the by laws

From Essex South to Suffolk
Mason, Nathaniel Robert, Marblehead

From Hampshire to Hampden
Miller, Ralph Thompson, Ware.
Starbuck, Amber Angela, Middlefield.

From Middlesex South to Norfolk
Bearse, Carl, Newton

From Middlesex South to Suffolk
Kennard, Harrison Eisenberry, Newton

From Norfolk to Suffolk
Graves, Roger Cutler, Brookline.
Ross, Rex Lewis, Jr., Wellesley Hills
Wetherbee, Winthrop, Brookline.

From Plymouth to Suffolk
Cheney, Robert Cartwright, Duxbury

DAVID N. BLAKELY, *Chairman.*

APPENDIX NO 3

REPORTS OF COMMITTEES APPOINTED TO CONSIDER
RESTORATION TO FELLOWSHIP

Restoration to fellowship was recommended for the following nine former members

J. B. Bakst, Lynn (Committee Frank E. Stone, John W. Trask and Saul M. Marcus)

Frederick W. Celce, Holyoke (Committee Edward P. Bagg, Jr., Fred H. Allen and Philip H. Clarke).

Abraham Green, Brookline (Committee Charles J. Kickham, Albert Ehrenfried and John A. Seth)

Aaron Kaufman, Boston (Committee Joseph J. Skirball, Allen P. Joslin and Maurice B. Strauss)

Raoul J. LeBeau, Spencer (Committee James C. Austin, John R. Fowler and Alfred W. Brown) The committee recommended remission of past dues

Joseph H. McLaughlin, Dorchester (Committee Henry F. R. Watts, Carlton E. Allard and William J. Walton)

Edward C. Messer, Dorchester (Committee David G. Eldridge, Samuel Nadel and John B. Hall) The committee recommended remission of past dues for one year (1932)

Morris J. Ritchie, Westfield (Committee Archibald J. Douglas, Edward S. Smith and Robert M. Marr)

Harry Silbert, Salem (Committee J. Frank Donaldson, Charles L. Curtus and John R. Shaughnessy)

APPENDIX NO 4

COMMITTEES APPOINTED TO CONSIDER PETITIONS
FOR RESTORATION TO FELLOWSHIP

The following committees were appointed to consider the petitions for restoration to fellowship of the following eleven former members

For Wyman Berenson, Mattapan
Samuel Nadel, Joseph I. Grover and Arthur T. Ronan

For Lillian D Chapman, Boston
 Louisa Paine Tingley, Florence L. Meredith and
 Marianna Taylor

For Oscar F Cox, Jr, Brookline
 Charles J Kickham, Maurice Gerstein and Frank
 W Marlow, Jr

For Max H Hymen, Lowell
 Mason D Bryant, Daniel J Ellison and Harold
 L. Leland.

For William Koppel, Framingham
 Hyman Morrison, Myer I. Berman and B Thur
 ber Guild

For George H. Lyons, West Roxbury
 Herbert L. Johnson, David L. Lionberger and
 Gerald L. Doherty

For Harold R. C. Mahar, Orange
 Stanton J Ten Broeck, Albert C Leach and
 Kirke L. Alexander

For J W P Murphy, Peabody
 John J Hickey, Ralph E. Foss and John F Brad
 ley

For Bernard H. Robinson, Newton Centre
 Max Ritvo, William F Cotting and Oliver G
 Tinkham.

For Samuel Kamberg, Boston
 Rudolph Jacoby, Somers Fraser and Seth M
 Fitchet.

For Francis J Vaccaro, Pittsfield
 Hugh J Downey, P J Sullivan and John J
 Boland.

APPENDIX NO 5

REPORT OF THE COMMITTEE ON ETHICS AND DISCIPLINE

During the year just ending nine meetings of the full committee were held, and at least as many conferences between two or more members. Eight personal hearings were accorded to fellows against whom complaints had been lodged.

The general character of complaints received and investigated was as follows

Unethical publicity — 16
 Unethical conduct in the practice of medicine — 5
 False or misleading testimony in court — 4
 Unethical behavior toward other physicians — 2
 Participation in the exploitation of nostrums — 2
 Collusion in fake damage suits — 1
 Aiding in advertising a commercial product — 1
 Abortion — 1
 Contract practice — 1
 Miscellaneous — 3

The disposition of the more important cases was as follows

Three fellows were recommended to the President for admonition.
 Two fellows were asked to resign from the Society and complied.
 Six fellows were rebuked orally or by letter
 Two fellows apologized in letters to the *Journal*
 No boards of trial were held.

Matters of especial interest were as follows

A fellow who, in connection with his hearing by a board of trial of a complaint against him, had brought suit for libel against the chairman and another

fellow, was recommended to the President for admonition, and was permitted to make a public apology in the pages of the *Journal*, in lieu of other proceedings against him

The cases of the two fellows whose resignations were asked for and received are naturally of great interest and importance. The first testified as an expert witness for the plaintiff in a suit for malpractice against a physician. In presenting his qualifications as an expert he made statements which proved to be false. The presiding justice declared a mistrial and fined him for contempt of court, and the Board of Registration in Medicine suspended his license for six months. The second fellow testified as an expert witness for the plaintiff in a suit against the estate of a deceased physician. The committee reviewed the official transcript of the testimony and found that the fellow had made many exaggerated and misleading statements in many of the issues involved, so that the testimony tended consistently toward the conviction of the apparently innocent defendant, and to defeat the ends of justice. This case had not been brought before the Board of Registration in Medicine, and the committee did not bring it to its attention, feeling that a resignation from the Society constituted punishment enough.

Throughout the year the committee has continued to co-operate with the Board of Registration in Medicine, especially by conferences between the chairman, and the secretary of the Board. It is believed that this co-operation can be continued and developed to mutual advantage.

During the year a beginning was made of an effort to standardize and formulate the attitude of the committee, and therefore of the Society, toward publicity pertaining to fellows in various situations, especially to the so-called education of the public in medical matters through the press and the radio. A tentative set of regulations was presented to the Council at the last meeting and it is planned to revise this if necessary and make it authentic.

DAVID CHEEVER, *Chairman*

APPENDIX NO 6

REPORT OF THE COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS

The Committee on Medical Education and Medical Diplomas has held two formal meetings during the year for the purpose of inspecting diplomas presented by candidates from foreign schools or from domestic schools or colleges not on the list recognized by the Society. This duty becomes increasingly difficult. The problem of how most fairly to regard licensed practitioners in Massachusetts who are not graduates of recognized medical schools and who wish to join our society is, indeed, a perplexing one.

During the last ten-and-a-half years 251 graduates of such schools have been admitted to fellowship in the Society as follows

YEAR	NO OF CANDIDATES
1928	22
1929	16
1930	20
1931	19
1932	25
1933	27

1934	22
1935	26
1936	24
1937	27
1938 (May meeting only)	23

Nowadays no Massachusetts hospital approved for intern training can have on its staff a physician who is not a member of the Society. Apparently because of this rule, increasing pressure is being put on the committee. At our last meeting we interviewed 42 candidates. The majority of them had been in practice for a minimum of five years and almost all presented enthusiastic letters from a number of fellows of the Society recommending that their credentials be accepted. In spite of the publication of the names of these candidates in the *Journal* before our committee met, we received almost no information pointing to a given candidate's unfitness.

In brief, so far as can be judged by the experience of the last decade, it is the policy of the Society gradually to elect an increasing number of members who have graduated from unrecognized or foreign medical schools. If this impression is incorrect, there now are pathways open by which confidential information concerning candidates can be submitted to proper authorities of the Society. Our committee must obey the by-laws as they are written and recognize diplomas submitted if they fulfill the requirements of the Society, unless specific information is given us concerning the undesirability of any prospective candidate.

A year ago the Council on Hospitals and Medical Education of the American Medical Association inspected the hospitals approved for intern training in Massachusetts. This council has been kind enough to submit its report to us so that our committee has on file the results of this inspection.

Interns, on the whole, appear to be receiving a fairly good training in Massachusetts. There still is a tendency for the better students to concentrate in the teaching hospitals, and for the less promising students to obtain rotating internships in the smaller ones. Many of the rotating internships continue to be too short. There still are too few necropsies performed in many hospitals. In certain institutions, work of high caliber from the intern is impossible because the amount of work to be done is so great and the number of interns to do it is so small.

Our committee has kept abreast of the Society's work in postgraduate education. This continues to be an important project. We hope that it may go forward and be well supported by all fellows. As is stated in our Code of Ethics, physicians should encourage sound medical learning and uphold in the community correct views of the powers and limitations of the science and art of medicine. There is no more effective method to fulfill this high purpose than by improving postgraduate education and by rendering it easily available to all physicians.

C. A. SPARROW,
E. S. CALDERWOOD,
A. W. STEARNS,
F. S. KELLOGG,
R. FITZ, *Chairman*

through a subcommittee consisting of Dr. Richard M. Smith (chairman) and the chairman of the Society's Committee of Public Health. Dr. George C. Shattuck has been elected president of the Massachusetts Central Health Council, the constitution and by-laws of which are being revised. This body, which is eager to co-operate with the Massachusetts Medical Society and the membership of which comprises nearly all the public, professional and lay agencies in Massachusetts concerned directly or indirectly with health, should be able to exert a helpful co-ordinating influence in the organization of the community health centers being promoted by the American Medical Association and approved by the Council of the Massachusetts Medical Society. So far as we can discover, there is no suggestion of any desire on the part of the Massachusetts Central Health Council to act in other than a co-operative manner in furthering the establishment of such community health centers.

2. The secretary of the Massachusetts Medical Society has referred to the Committee on Public Health an interesting communication from Mrs. Harriet Treat Hanson, chairman of public health, Massachusetts State Federation of Women's Clubs. This communication reads as follows:

To the Members of the Massachusetts Medical Society

The Division of Public Health of the Massachusetts State Federation of Women's Clubs is actively interested in the campaign to eliminate, so far as possible, the diseases, syphilis and gonorrhea. Recognizing the medical profession as the leading instrument through which control may become effective, this committee presents the following resolution for your consideration. This resolution has the endorsement of one hundred and sixty-three clubs representing about 23,000 women.

This resolution is drawn with the intent of gaining the co-operation of layman and doctor alike in preventing congenital syphilis. We feel that a dignified, educational, professional treatment of the problem is to be preferred to one of legislative intent. It is with full recognition of the rights and privileges of the physician to use or reject this suggestion that we present it to you. We have no intention of infringing upon the personal rights of either patient or physician.

Therefore, since we have been given to understand, from recognized authorities upon this disease, that if syphilis is detected in the pregnant woman sufficiently early, and if, when detected, is treated there is a strong possibility, in most cases, that the child will be born free of the disease,

We the members of the following one hundred and sixty-three federated women's clubs do resolve that we favor a serological test being made part of the routine examination of every pregnant woman by her physician. [A list of the clubs then follows.]

Respectfully submitted,

[Signed] HARRIET TREAT HANSON,
Chairman of Public Health
Massachusetts State Federation
of Women's Clubs.

The following joint resolution was unanimously passed by the Committee on Public Health and the Subcommittee on Public Education and a copy sent to the secretary of the Section on Obstetrics and Gynecology, with an accompanying letter requesting its consideration by the section and expressing the hope that similar favorable action would be taken by the section.

APPENDIX NO 7

REPORT OF THE COMMITTEE ON PUBLIC HEALTH

The Committee on Public Health of the Massachusetts Medical Society and the Subcommittee on Public Education beg leave to submit the following report:

1. The Committee on Public Health has been in close touch with the Massachusetts Central Health Council

RESOLVED, that the Committee on Public Health and the Subcommittee on Public Education unanimously welcome the interest and support of the one hundred and sixty three women's clubs of the State of Massachusetts in the resolution presented by Mrs. Harriet Treat Hanson, chairman of public health of the Massachusetts State Federation of Women's Clubs, favoring a serological test in the detection of syphilis, particularly in pregnant women, and heartily approve of the suggestion urging the continuance and extension of this practice to include all such cases

3 The Subcommittee on Public Education has continued to endeavor to make as useful as possible the radio broadcasts on health announced as Green Lights to Health and sponsored by the Massachusetts Medical Society and the Massachusetts Department of Public Health. A still more favorable time has been assigned to these broadcasts, which are now delivered on every Wednesday evening from 8 15 to 8 30 over Station WAAB and the Colonial Network. Every broadcast thus far delivered has evoked requests for copies which by arrangement with the Department of Public Health have been mailed. These requests have varied from 7 to 71 (Heart Disease by Dr. William H. Robey), and the numbers have materially increased as the series has progressed. We are informed that a fair index of the size of a radio audience may be roughly estimated by considering that each request represents 1000 listeners. Thus far over 700 of these so-called fan letters have been received and it would seem probable, therefore, that over 700,000 people have been reached by one or more of these broadcasts. Requests for copies of the complete series have been received from several distant states. The committee believes that this evidence suggests the wisdom of continuing with the effort. The Subcommittee on Public Education desires to again thank the fellows of the Society for their willingness to prepare these broadcasts and to accept in such a co-operative spirit the few suggestions of the committee as to the form and content of their presentation.

ROBERT B. OSGOOD, *Chairman*
GERALD HOFFEL, *Secretary*

APPENDIX NO 8

REPORT OF THE COMMITTEE ON MEDICAL DEFENSE

Our committee reports for the year about the same state of activity, or lack of it, as last year. We have had one new case, defense of which we have taken on. We have had two verdicts—both in our favor—during the year.

I took up the matter of perhaps giving up the defense of members at the last meeting of the Council. Since then, I have written to all the members of our committee and find that a majority disagree with me. No other member of the Council wrote me a word about my suggestion so I withdrew it.

There are many other things that come up besides the actual defense of cases, and I have given a number of men advice where suits have been threatened.

We have had the first result of the new arrangement about employment of counsel, and one doctor has taken advantage of the facts that a doctor is allowed to choose his own counsel and that the Society will pay the bill subject to its approval by the chairman of our committee. There is no bill as yet so I have had no argument over it. I am rather glad that the committee felt that the pro-

tection should not be given up, as I think the effect on people who bring suits in the hope of having them compromised is excellent when they find that the Massachusetts Medical Society defends but pays no verdicts. It is a most discouraging situation when they realize that even if they win they may not collect a cent.

Members who have been asked by our attorneys to testify as experts have been most obliging about doing so, and our committee feels sure the Society is most grateful to them.

FRANKLIN G. BALCH, *Chairman*

APPENDIX NO 9

REPORT OF THE COMMITTEE ON POSTGRADUATE INSTRUCTION

Since the autumn of 1937 the committee has organized a faculty and provided extension courses in postgraduate instruction for the entire medical profession of the Commonwealth. This has been done in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service, and the Children's Bureau, United States Department of Labor. The committee wishes to report that the co-operation of these government agencies has been very helpful in every respect, and it wishes to take this opportunity to thank Dr. Henry D. Chadwick, of the State Department of Public Health, for his personal interest in helping to make the program a success.

The attendance record of the districts for the past three seasons is given below. The tabulation shows an increase in attendance of 35 per cent over last year. The committee feels that this attendance out of a total of seven thousand doctors should be increased. Every doctor in the respective districts received a copy of the program in advance of the meetings, and the courses were given without charge. Most of the district chairmen report that they anticipate increased interest next year.

The committee wishes to express the appreciation of the Society for the excellent work of the faculty. The chairman of each course and each instructor gave much time and thought to methods of improving the technique of postgraduate teaching. The committee arranged with the Harvard Graduate School of Education for consultation service in pedagogy, Dr. Warren C. Seyfert of this school gave lectures and personal conferences to the faculty.

The Society appropriated one thousand dollars toward administration expense while the government agencies have contributed sufficient funds to cover other expenses, another financial report will be made at the next Council meeting. This program was made out with the idea of continuing it for three years. The committee has made out a new curriculum along similar lines for next season and is planning a budget for the consideration of the Massachusetts Department of Public Health and the other government agencies.

The Executive Committee has discussed the possibility of having a Clinical Congress some time during the fall with the idea that such a congress would be correlated with the current extension courses. It is recommended that the Massachusetts Medical Society sponsor such a clinical congress.

The committee recommends that the Society continue to co-operate with the government agencies in giving extension postgraduate courses and that the committee be continued.

FRANK R. OBER, *Chairman*
LEROY E. PARKINS, *Secretary*

ATTENDANCE AT EXTENSION COURSES

DISTRICT	PLACE	1936	1937	1938
Barnstable	Hyannis	29	21	22
Berkshire	Pittsfield	44	41	55
Bristol North	Taunton	16	24	27
Bristol South	Fall River	14	21	20
	New Bedford	40	45	38
Essex North	Lawrence	22 (no course)		31
Essex South	Salem	66	62	58
Franklin	Greenfield	20	29	28
Hampden	Holyoke	26	32	33
	Springfield	50	32	50
Hampshire	Northampton	32	29	32
Middlesex East	Melrose	14	13	42
Worcester North	Lowell	30	37	32
Middlesex South	Cambridge	71	43	80
Norfolk	Norwood	29	13	24
Norfolk South	Quincy	21	12	30
Plymouth	Brockton	27	20	37
Worcester	Milford	24	26	23
Worcester North	Fitchburg	23	24	46
Totals		598	524	708

APPENDIX NO 10

REPORT OF THE COMMITTEE ON PUBLIC RELATIONS

The Committee on Public Relations has held two meetings since its report to the Council in February, considering among other things the Lane Resolution, district health councils and the American Medical Association Survey, and immunization programs

The several districts are, with success perhaps varying directly with the effort expended, attempting to increase the amount of immunization done by the family physician. It is encouraging to hear that 30 per cent of this work in Boston is now done by him

The Lane Resolution was referred to us by the Council for study and recommendations, and the committee yesterday voted as follows

- 1 The Committee on Public Relations recommends that the Council approve the following resolution (with the proviso that as this resolution affects the specialties known as pathology, roentgenology and anesthesia, it be held in abeyance for the time being)

RESOLVED, That we approve the prepared hospital plan with the stipulation that the contract benefit provided by group hospitalization insurance shall be limited to hospital accommodations such as room, bed, board, operating room facilities, and general nursing care ordinarily provided by hospitals, routine drugs, and the routine services of interns only when acting under the direction of the attending physician, and that except as stated above, the contract shall not include the services of physicians either general or special.

The term "physician" as used here shall be understood to include all licensed practitioners holding the degree of Doctor of Medicine, who assume on their own account to interpret laboratory and x-ray findings in terms of disease and diagnosis, or to administer or direct treatment.

- 2 The committee urges the Council to recommend that the organized anesthetists, roentgenologists, and pathologists take up with the Hospital Council of Boston and the New England Hospital Associa-

tion certain very important fundamental problems in medicine related to this discussion, with the hope of reaching a decision which will be mutually agreeable to the hospitals and organized medicine.

- 3 The committee recommends to the Council that it approve the survey the American Medical Association is making on the adequacy of medical care and further recommends that the Massachusetts Medical Society accept responsibility for the proper analysis and tabulation of the material collected by the district societies

ELMER S BAGNALL, *Secretary*

APPENDIX NO 11

REPORT OF THE COMMITTEE ON PHYSICAL THERAPY

The Committee on Physical Therapy is largely concerned with education—both of the graduate and of the undergraduate—and is deeply interested in attaining the following three objectives

- 1 For the undergraduate medical student, we hope there may be instruction in this branch of medicine in all our medical schools in the immediate future. It is of definite, practical importance to all physicians to know the limitations as well as the value of physical therapy measures, and the need also for scientifically controlled investigation in this field. If this possibility is denied the medical student, he is prone to depend largely on the commercial salesman for whatever information he may acquire.
- 2 For those who are already in practice, this committee will be glad to furnish programs for medical society meetings. Talks can be given concerning the fundamentals of those types of treatment having a practical bearing for the general practitioner, or whatever aspect of the field seems most interesting to the members. During the past three years, we have provided programs in various parts of the State and would be happy to confer with anyone interested. This matter appeals to us as of very definite importance. Physical therapy appears to be less generally recognized and developed here in the United States than in England and the Continent, where it commands the interest of the most highly reputed physicians and medical organizations.
- 3 For both the undergraduates and the graduates, your committee hopes for a further development of physical therapy clinics, to include all the teaching hospitals of Boston. Such clinics should be available to the undergraduates for elementary observation, and also to them could come the graduates as visitors or students. In these clinics should be carried on practical and research work, which should be undertaken, in co-operation with the various other departments of the hospital, along scientific lines.

Such a program as we have here outlined would go far toward the education of us all in emphasizing the importance of this branch of medicine. It is the desire of your committee to be of as great assistance as possible in presenting what has proved to be of definite and practical value in this type of therapy. However, we can do but little without your help. May we have your co-operation in this program?

ROBERT B OSGOOD,
GEORGE R. MINOT,
FRANKLIN P. LOWRY, *Chairman*

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED
IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24261

PRESENTATION OF CASE

A thirty-nine-year-old, white, American lawyer entered the hospital with the complaint of slight dyspnea of three years' duration.

About seven years before entry he began to have a slight dry cough which persisted practically unchanged up to the time of entry. About three years before entry he noticed that he was inclined to be slightly dyspneic. This also persisted. During the three years he had four attacks of discomfort in his chest characterized by a feeling of heaviness and compression. These were accompanied by a "cold" without fever, and they lasted two or three weeks. His past history and family history were essentially negative, and he had no other cardiorespiratory symptoms.

Physical examination revealed a well-developed and nourished man in apparent good health. The pupils were symmetrical and reacted to light and accommodation, and there was no lid drop. The left lobe of the thyroid was slightly smaller than the right. The heart and lungs were negative except for questionable dullness at the right apex posteriorly. The blood pressure was 150 systolic, 110 diastolic in the right arm, and 125 systolic, 85 diastolic in the left arm. The abdomen was negative.

The temperature was 98°F., the pulse 82. The respirations were 20.

The urine examination was negative. An x-ray of the chest showed an irregular area of density measuring about 7 cm. in diameter occupying the medial aspect of the apex of the left lung. The center of this shadow was posterior to the trachea but about opposite the vertical axis of the body. Its anterior and inferior margins were sharp in outline and definitely nodular. This appearance was accentuated by a sharply defined linear area of diminished density simulating fatty tissue, which adjoined the inferior margin. The shadow did not obliterate all the air in the lateral aspect of the left apex. Within the shadow there were areas of calcification measuring 1 to 5 mm. in diameter, some of which appeared to form part of the margin. They did not shift in position. The trachea and esophagus were apparently in contact with the medial aspect of the shadow but were not

displaced. There were questionable pressure defects on the posterior aspect of the trachea and on the lateral aspect of the esophagus. The regional ribs and vertebrae were normal, and there was no involvement of the mediastinum near the arch of the aorta or at the lung roots. The remainder of the lung fields was clear.

An operation was performed on the day of admission.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON: I cannot add much to the description. I can merely point out the things that were mentioned. The mass is definitely nodular as you can see better here in the lateral view. There is some calcification in the periphery, some concentrated in the center and some scattered in rare local deposits, which are somewhat round. These calcified areas did not shift in position, ruling out the possibility that they were calcium granules within a fluid-containing mass. The absence of deformity of the trachea was quite impressive to me as I examined the patient. We thought of tumor of the thyroid because of the character of the calcification, location of the tumor, and so on. But a tumor of the thyroid of that extent should deform the trachea and esophagus. When Dr. Holmes saw these films he said the calcification and shape of the mass were similar to an osteochondroma. We had no other evidence, and nothing further to offer as diagnostic possibilities.

DR. JOHN W. STRIEDER: * On the basis of the films could you place the tumor within the lung?

DR. HAMPTON: That would be very difficult to answer, and yet, if you consider that it seems to be surrounded by lung anteriorly and posteriorly, it would have to be either a pedunculated tumor which has invaginated into the lung or a tumor which arises within the lung.

DR. STRIEDER: There is a definite pressure defect in the esophagus?

DR. HAMPTON: The esophagus seems to be displaced toward the mass and just shows this slight concave defect which is not definite.

DIFFERENTIAL DIAGNOSIS

DR. STRIEDER: With the x-ray evidence of intrathoracic tumor the discussion resolves itself into one along more or less broad philosophical lines and one has to run the gamut of most of the tumors of the thorax. However, the fact that there is definite calcification within the tumor is very significant, because it narrows down our differential diagnosis considerably.

*Assistant in surgery, Harvard Medical School; visiting surgeon, Massachusetts Memorial Hospitals; associate surgeon, Boston City Hospital.

Given an intrathoracic tumor, however, I think the differential diagnosis depends largely upon the x-ray. In running over some of the possibilities we can divide them into inflammatory and noninflammatory types. In the first place, aneurysm with calcification is a possibility that must be considered, but the facts that it is not in relation to the arch of the aorta and that other findings were not present on physical examination seem to me to place it outside our consideration. We have no supporting evidence from fluoroscopy, and the result of the Hinton test is not noted. The fact that there is a difference of blood pressure in the two arms is not conclusive, because pressure from without upon a vessel might give such a finding.

Old pulmonary abscess with calcification is also a possibility. The location is a little unusual, and nowhere in the history has there been an episode of an acute febrile attack from which there arose quantities of purulent foul or nonfoul sputum, also, the temperature was normal, but it may well be in a situation such as this. However, I think we can exclude pulmonary abscess. Mediastinal abscess is rare. There was no fever and there are no bone changes, which would exclude pyogenic or tuberculous mediastinal abscess.

So far as tuberculosis of the lung itself goes, such a picture is possible but not probable. We have seen circumscribed lesions with calcification on a tuberculous basis. There is no other evidence of tuberculosis in the lung fields and, in addition to the history, this is the greatest single factor in excluding it.

Could it be an encapsulated empyema? There is no history of an acute febrile episode, and the location of such an encapsulation would be unusual, to say the least.

Echinococcus cyst I mention only in passing. It is a possibility but so extremely rare in North America that we can exclude it.

As for neoplasm, dermoid cyst would be a possibility if the tumor had a pedicle which permitted it to wander somewhat. However, the facts that the trachea is not displaced and that there are only moderate pressure defects of the esophagus seem to militate against it. I cannot rule it out. Substernal goiter, of such size and location, one would expect to be associated with some changes in the trachea. Also, it lies posterior to the trachea, which would be an unusual place for thoracic goiter, although they are apt to be migratory in character. Neurofibroma is also a possibility, but there is no bone destruction. I do not know how significant calcification, in general, is in neurofibroma. My impression is that it is not common. Tumors of the rib or bone, such as osteoma, osteochondroma or osteosarcoma, can be ruled out on

the basis of the history and the x-ray findings. There was no evidence of bone destruction or bone involvement. A tumor of the lymphoma series is a possibility, although such a discrete lesion and such a location I think make it unlikely. We have no information as to the blood picture but that in itself probably would not be very much help. I question the appearance of calcification in a Hodgkin's tumor. Primary pleural tumors are rare and I think there is nothing about this case to suggest one. Lipoma of such a size within the thorax would give some alteration of the interspaces if it presented through the thorax, as we might expect it to do. So much for extrapulmonary neoplasms.

Of the intrapulmonary neoplasms, by far the commonest is bronchiogenic carcinoma. This man's history does not suggest it. There should have been some blood spitting or streaking of the sputum with blood. Moreover, a tumor of this size ought to cause some general symptoms, and the presence of calcification within the tumor makes it rather unlikely in my opinion. Benign tumors of the lung are exceedingly rare, by far the commonest of these is chondroma, arising primarily in the lung, as distinguished from adenoma of the bronchus with calcification of the stroma, which does occur. A primary chondroma of the lung is perhaps the commonest of the lung tumors if one excludes bronchiogenic adenoma and carcinoma, and my inclination has been to consider chondroma quite seriously. I was interested to hear that Dr. Holmes thought about it in somewhat the same way. Adenoma usually occurs in relation to one of the larger primary or secondary bronchi, and before it attains this size should give symptoms of suppuration, due to stenosis by encroachment on the lumen of the bronchus from which it arose.

We have no evidence to assume that this is a metastatic tumor. I have seen a solitary metastasis from hypernephroma which was much the same but had no calcification in it.

I dislike "digging so far down into the bag" to make a diagnosis of a rare tumor, but I think the descriptions that have been reported by Hickey and Simpson of primary chondroma of the lung which have lobulated borders and areas of calcification, and the fact that there is rarefaction at the border of this tumor, to my mind make it a likely diagnosis. I should like to place chondroma of the lung as my first diagnosis. I cannot rule out a dermoid cyst, and I cannot be sure that substernal goiter is not a possibility.

CLINICAL DISCUSSION

DR. EDWARD D. CHURCHILL: We despaired of giving an accurate histologic diagnosis. The gen-

eral practical problem involved was how to approach this tumor. If it were a substernal goiter it might have a large vascular pedicle coming down from the inferior thyroid artery. In such a case a cervical incision would aid in control of the blood supply. If it were a *neurofibroma* it should be approached posteriorly. If it were a primary tumor in the lung apex we should prefer to make an anterior approach through the chest. We worried a good deal as to whether we should place our incision correctly, but weighing all the evidence decided to approach through the anterior chest wall at the level of the third rib. I think probably an artificial pneumothorax for diagnostic purposes would have helped us. It might have shown more definitely whether the tumor was in the lung or mediastinum. A good deal of the evidence that the x-ray department is now bringing out is given in retrospect, and if I recall the situation accurately, Dr Hampton really thought it was a substernal goiter. At any rate, we chose an anterior incision which proved to be the correct one as the tumor did arise in the apex of the lung and was attached by only one adhesion to the mediastinum.

DR TRACY B MALLORY: Do you want to describe the gross findings, Dr Churchill?

DR CHURCHILL: The tumor was situated in the extreme apex of the thorax and was adherent at only one point. After severing this adhesion it could be lifted from the chest, bringing the apex of the lung with it. The surface of the tumor was white and glistening and resembled a piece of coral. Its appearance called to mind certain ovarian tumors with papillary projections from the surface. Its removal required resection of a small piece of lung tissue in the apical region.

The condition of the parietal pleura was interesting in regard to the symptoms. There was definite evidence of chronic pleuritis probably resulting from mechanical trauma from the tumor. The pleura was thickened and there was heavy fatty infiltration under the parietal pleura. I think his sensations of pressure and pain at the apex were undoubtedly due purely to the mechanical trauma of the tumor on the parietal pleura.

PREOPERATIVE DIAGNOSIS

Calcified adenoma of thyroid?
Primary tumor of lung?

DR. STRIEDER'S DIAGNOSIS

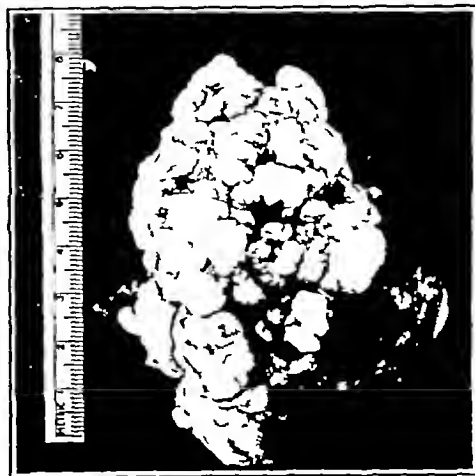
Chondroma of the lung

ANATOMICAL DIAGNOSIS

Hamartoma of the lung

PATHOLOGICAL DISCUSSION

DR MALLORY: The tumor proved to be what Dr Strieder predicted, usually called a chondroma. There has, however, been a good deal of discussion in the literature as to how these tumors should be classified from the pathological point



The coral-like mass of cartilage and glandular tissue found at the apex of the left lung

of view. We wound up by making a diagnosis which is probably an unfamiliar one to most of you. We called it a hamartoma. The term was suggested by Albrecht in 1905. I thought it well to bring along the definition.*

Hamartomata are tumour like malformations in which occurs actually only an abnormal mixing of the normal components of the organ. The abnormality may take the form of a change in quantity, arrangement or degree of differentiation, or may comprise all three. The deduction to be drawn from histological examination of these formations is that they have originated in an abnormal mixing of the elements or from disturbances of their development.

This tumor on histological examination is made up mostly of cartilage with foci of calcification in it, but between the many small masses of cartilage is a loose areolar fibrous tissue containing cyst-like spaces. The latter are lined with epithelium, the majority of which is low and cuboidal, but in two or three places definitely tall, columnar and ciliated, in other words characteristic respiration epithelium, so that the tumor is a mixed tumor and not a true chondroma. One might ask why it is not a teratoma. A teratoma is theoretically a tumor arising from misplaced germ cells that have the potentiality of differentiation toward all forms of tissue that can be found in the body. In a teratoma one gets hair, squamous epithelium,

Goldsworthy N. E. Chondroma of the lung (hamartoma chondroma iustum pulmonis) with report of a case. *J Path. & Bact.* 39:291-298 1934

possibly neuroglia, nerve cells, and so on. In this case we have no elements present except the elements that are normal in lung tissue, and therefore it seems to fit perfectly into this definition of hamartoma. The diagnosis is made in other organs as well. In children one may occasionally see a hamartoma of the liver made up of large collections of liver cells and bile ducts without normal liver architecture.

DR HAMPTON: Is there any explanation for the line of diminished density medial to the tumor which looked like fat?

DR MALLORY: These tumors have been reported to contain fat in a number of instances. We found a few fat cells in this one but not a large enough amount to account for the x-ray findings.

DR CHURCHILL: It might have been fat under the mediastinal pleura.

DR HAMPTON: That was what I had in mind.

DR CHURCHILL: A protecting fat bed was present around this tumor subpleurally.

DR HAMPTON: That was the peculiar part of the whole thing to me. I did not mention it today because I thought it would only be misleading.

DR STRIEDER: In the cases reported by Hickey and Simpson they lay great stress on this linear shadow of decreased density. The two tumors they have described as chondroma were probably hamartomas because the histological description of this case as given by Dr. Mallory fits very well with what they reported.

CASE 24262

PRESENTATION OF CASE

An eighteen-year-old, white, American housemaid entered the hospital with the complaint of abdominal pain of three days' duration.

Three days before entry on waking in the morning she noticed steady, sharp, stabbing pain in the epigastrium, right-lower quadrant and right flank which persisted unchanged in intensity and character until the time of entry. It was sufficiently severe to keep her awake at night but for the first two days did not confine her to bed. On the morning of the day before entry her physician put her to bed and prescribed hot fluids by mouth, which apparently had no effect on the pain. She had some anorexia with occasional nausea, but no vomiting. During that day she had two shaking chills, but she said she did not feel feverish. During her illness she also had frequency, severe dysuria, and nocturia six or seven times each night, but no hematuria. She had no vaginal discharge, and her bowels moved regularly. She had photophobia which she had also had for a period of a month four months previously. Her menstrual pe-

riods had begun at the age of twelve and except for mild cramps were regular and normal up to one year before entry, when they ceased entirely. Two years before entry she had had a vaginal discharge which was adequately treated at an outside institution and cleared up in three weeks. For about seven years she had had a chronic unproductive cough accompanied by slight chest pain. There was no family history of tuberculosis, but at one time chest x-rays were taken of both her and her sister by the state health department. Her past and family histories were otherwise noncontributory.

Physical examination revealed a fairly well-developed, well-nourished girl complaining of pain in the right lower quadrant. An eye consultant could find no evidence of disease in the eyes and treated the photophobia with drops. The heart and lungs were negative, and the blood pressure was 108 systolic, 60 diastolic. There was marked tenderness in the right side of the abdomen, most marked in the right-lower quadrant with questionable spasm. A lemon-sized mass which was thought to represent the cecum was palpable in the right-lower quadrant. On pelvic examination the introitus admitted two fingers. There was tenderness in both vaults, more marked on the right, with a questionable mass on the right. The fundus of the uterus was displaced anteriorly and was freely movable.

The temperature was 98.4°F., the pulse 78. The respirations were 20.

The urine examination was negative. The blood showed a white-cell count of 15,700 which fell to 12,800 in the next eighteen hours. The blood Hinton test was negative, and the nonprotein nitrogen was 25 mg per cent.

An intravenous pyelogram showed normal kidney pelvis, ureters and bladder. The kidneys were visible and appeared to be rather small. Scattered throughout the abdomen were numerous irregular areas of calcification having the appearance of calcified tuberculous glands. No stones were demonstrated.

On the third day the white-cell count was 13,800 and on the fourth day 12,000.

A laparotomy was performed on the fourth day.

DIFFERENTIAL DIAGNOSIS

DR LANGDON PARSONS: This is obviously a history of an acute abdominal condition which came on suddenly and was of only a few days' duration. The pain was steady and sharp, without acute exacerbations, and was in the mid-epigastrium and the right-lower quadrant and flank. One interesting feature is that there was no relief of pain on

lying down. It was worse at night. Apparently there was no general systemic reaction because she was up and about. She had occasional nausea, but apparently no vomiting. She had two shaking chills, and also frequency, dysuria and nocturia. If one takes just the history alone one can think of three or four diagnoses. It could be, of course, a smoldering case of appendicitis, although there are certain definite things against that, such as the steady character of pain and failure to localize after three days, and the fact that there was no story of fever. The only temperature recorded was the normal one on admission. One could also work out a good case for urinary infection, with the frequency, the dysuria and the right-flank pain. The intravenous pyelogram was negative, however. The white count of 15,000 would be consistent with either of these possibilities. Also an ovarian cyst would fit into this picture perfectly well on the basis of the early acute history. If it were an ovarian cyst I should rather believe it was a cyst that had ruptured rather than a twisted cyst, and the urinary symptoms might come from peritoneal irritation or from pressure.

In the past history I do not know how to explain the photophobia which she had for a month. There are no signs on physical examination to give a lead as to what it might have been. The eye consultant could find nothing. There may be an association with the amenorrhea which came on after five years. Since there is no history of drugs, iodism or anything else, it cannot be explained on a toxic basis. The amenorrhea is of considerable interest. Her menstrual periods started at twelve and were normal up to the age of seventeen, one year before entry, when they ceased entirely. There are no other suggestions on physical examination or in the history to suggest a pituitary type of failure or thyroid deficiency, or any difficulty with the thyroid itself. One would have to think that this was a primary ovarian type of failure of some sort. The vaginal discharge does not amount to much, perhaps it was due to *Trichomonas vaginalis* and cleared up under treatment.

She has suggestive but unproved tuberculosis. She had a history of unproductive cough for seven years, with chest pain, but there is no family history of tuberculosis. She had a chest plate but they do not tell us what it showed.

DR. TRACY B. MALLORY: The chest plate was reported negative.

DR. PARSONS: On physical examination there is definite tenderness in the right lower quadrant with questionable spasm. The mass as described

does not help us very much. It was a questionable mass which was thought to be cecum, but we have no note as to whether it was soft or hard, tender or movable, or about its relation to the pelvic mass, which was also questionable. On pelvic examination there is tenderness in both vaults. The most interesting feature about the pelvic examination is the statement that the uterus was displaced anteriorly. They say nothing about the uterus's being in anterior position. They simply have noted that it was displaced anteriorly and that suggests displacement from the presence of a mass behind the uterus. A questionable mass in that region, with the tenderness, would tend to localize the difficulty pretty well in the pelvis. The abdominal plate which showed calcified glands may or may not have some bearing on this picture.

If I were confronted with this problem and had to operate I should make a midline incision. If pressed for a diagnosis, I should tend to state that there was a tuberculous salpingitis, which one could work out on the basis of questionable chest lesions of the calcified mesenteric glands, of the amenorrhea extending over a period of years and of the very questionable mass behind the uterus. I cannot help believing, however, that we are dealing with an ovarian cyst which has perhaps ruptured, thus accounting for the acute abdominal symptoms, and I still have the diagnosis of appendicitis in the back of my mind.

DR. WILLIAM B. BREED: Was there any displacement of the psoas muscle by x-ray, Dr. Holmes?

DR. GEORGE W. HOLMES: The muscles are not very clear on either side, but I should think they are negative.

DR. A. THORNTON SCOTT: What are the peculiar shadows in the upper corner, low in the pelvis and overlying the midsacrum?

DR. HOLMES: It is possible that they are mesenteric nodes low in the pelvis. They are a little large for phleboliths, and I do not believe they are stones in the ureter or bladder. They are outside the bladder and not in the ureter. A stone that size in the ureter would block it.

DR. SCOTT: Could they be contents of a cyst?

DR. HOLMES: One ought to think of dermoid, but there is nothing characteristic about the shadows and no other soft-tissue mass around them.

DR. BREED: I should like to ask how often rupture of an ovarian cyst occurs.

DR. PARSONS: As I have reported here before,

I was rather struck with the fact that in 120 consecutive cases of endometriosis, not all with ovarian involvement, 20 came into the hospital with an admission diagnosis of acute abdominal disease and most of these were proved to have rupture of the cyst. Follicular cysts also may produce symptoms when they rupture, but rupture of cystic neoplasms of the ovary is certainly uncommon.

PREOPERATIVE DIAGNOSIS

Calcified mesenteric glands

DR. PARSONS'S DIAGNOSIS

Ruptured ovarian cyst

ANATOMICAL DIAGNOSIS

Tuberculous salpingitis

PATHOLOGICAL DISCUSSION

DR. MALLORY This patient was explored by Dr. Claude E. Welch. He made a right rectus incision and found many enlarged, some soft and some calcified mesenteric glands. Both ovaries and tubes were bound tight to the posterior surface of the uterus and several spots of gross caseation were found in the wall of the tube, so he made a diagnosis of tuberculous salpingitis. This was confirmed in the laboratory. The cecum was entirely normal so far as he could make out on examination.

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THE BRITISH HEALTH SERVICES

A GROUP of more than one hundred Englishmen under the designation PEP (Political and Economic Planning) has been engaged in fact-finding studies and "in suggesting principles and possible advances over a wide range of social and economic activities" in Great Britain.

Ten volumes have been published by the group, and its continuing investigations are set forth by supplementary fortnightly broadcasts carrying accounts of work underway with findings and commentaries on selected sociologic and economic problems.

Under the direction of PEP more than two hundred persons and organizations have devoted over three years to a study of British health services. In December, 1937, the results of these investigations were published, with appropriate con-

clusions and recommendations, in a volume¹ of four hundred and thirty pages. This is the most voluminous and probably the most important of the ten reports.

In explanation of the complicated public-health activities of England now in operation, there are detailed accounts of every agency engaged in the administrative functions connected therewith, together with reports of contemporary official and voluntary bodies connected with organized medicine, dentistry and nursing.

The opinion is expressed by PEP that the average doctor is so occupied with the care of illness that, except among especial groups, little attention is bestowed on the causes of illness, with the result that the hiatus existing between curative and preventive medicine has not been adequately bridged. This explains to some extent the unsatisfactory situation relating to the existing health-administration system,—or rather many systems which theoretically interlock,—which according to PEP fails of desired results because of inherent complications incident to overlapping and uncoordinated procedure by many departments that include some health problems requiring professional services or opinions, such as, industrial health insurance, education, housing and venereal-disease control. To remedy existing conditions PEP asks "What are health services?" evidently hoping to differentiate administrative and medical-service functions, but one cannot find that the attempt to answer clarifies the situation.

In commenting on this phase of existing conditions the editors² of the *Lancet* contend that every agency should be enlisted to help promote good health (this is axiomatic) and so relieve the health services proper of congestion, overwork and poverty, and particularly that the general practitioner should recognize his strategic position for making the resources of such services available in dealing with the peculiarities and needs of the individual consumer of health services. We confess to a little confusion with respect to the application of these suggestions which may be due to inability to understand the situation in Great Britain, and when one reads Chapter V of the report, devoted

to "The Medical Profession," and learns of the duties and responsibilities of the registered doctor in that country,—acting, as most of them do, as agents of the government in one capacity or another, or engaged in fields unassociated with health work,—the likelihood of the general adoption of the latter suggestion seems somewhat remote

Both the *Lancet* and PEP agree that there is room for improvement in the medical service under National Health Insurance, with extension to include more consideration of individuals, and especially a co-ordination of the agencies for attacking disease and disability

Further confirmation of the criticisms of the British health administration is furnished by the *British Medical Journal*—the official organ of the British Medical Association, which, in its reference³ to the survey by PEP, states "This survey is more comprehensive in its range than anything that has yet been done and more frankly, though constructively, critical of the chaos in which the many independent and sometimes conflicting health agencies operate"

As one reads the several reports included in this survey and the confirmatory opinions relating to the facts, conclusions and recommendations submitted, it is apparent that there is dissatisfaction in the minds of the medical profession and public-spirited citizens with the existent health services in that country and that there are now before the British government alleged facts and suggestions which seem to demand action

It may be fair, however, to turn the shield about and see the other side. One finds that England has accomplished a great deal in efforts to improve social conditions, safeguard health and bring the resources of medicine to bear on the ills of her people. The question seems to be largely that of organization and application

PEP has certainly placed before the world suggestions for ideals of service and methods of procedure which warrant consideration not only by Great Britain but by other countries as well

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MEDICAL LIBRARY ASSOCIATION

THE Medical Library Association's meeting in Boston on June 28, 29 and 30 celebrated the completion of forty years' existence of the association. Organized in Philadelphia in 1898 with eight charter members, the association has grown until, at the present time, it has a membership of over five hundred and is international in scope. It ranks in importance with such associations as the American Library Association and the Special Libraries Association. During the past ten years, it has been actively engaged in a campaign to reduce the excessive cost of German periodicals and has accomplished a great deal in this particular endeavor, resulting in a great saving to medical libraries of the world.

Such men as Sir William Osler and Dr James Read Chadwick and Dr John Woodford Farlow, of Boston, have served as presidents of the association. The association had met in Boston on three previous occasions during the presidencies of Drs Chadwick and Farlow, and at this fortieth meeting, the president for the year was James F Ballard, director of the Boston Medical Library.

The chairman of the Program and Entertainment Committee was Dr Henry R Viets, librarian of the Boston Medical Library, and the chairman of the Committee on Local Arrangements was Miss Anna C Holt, librarian of the Harvard Medical School.

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CASE HISTORY No 78 PLACENTA PREVIA AFTER
VIABILITY

Mrs E. E., a twenty-five-year-old essential primipara, on February 5, when a little over nine weeks pregnant, passed considerable bright blood. She was put to bed.

The family history was essentially negative. She had had nasal diphtheria as a child and her tonsils had been removed, her past history was otherwise negative. Catamenia began at eleven, were usually ten to fourteen days late, and lasted from five to seven days, with no real pain. She had had one early miscarriage. Her last period was December 24, making her due for delivery late in September.

A physical examination on the day of bleeding showed a well-developed and nourished young woman. Her heart showed no enlargement, there were no murmurs. Her lungs were clear and resonant, there were no rales. The blood pressure was 110 systolic, 60 diastolic. A vaginal examination showed the uterus to be deep in the pelvis, the cervix soft, and the fundus in the first degree of retroversion.

A vaginal examination ten days after she had been put to bed showed no polyp of the cervix. After she had been in bed a little over four weeks she was allowed to resume her normal life.

Her pregnancy remained uninterrupted and uneventful until July 18—approximately twenty-eight or twenty-nine weeks after her last period. At this time she had a little more discharge, the uterus was not irritable, and the fetal heart was heard. In view of the previous bleeding at nine weeks she was kept quiet at home. Three weeks later, when she was about thirty-two or thirty-three weeks pregnant, she had some painless bleeding which she estimated amounted to about a cup and a half, and several hours later she passed a small clot. The uterus was enlarging normally, and the fetal heart was heard. She was removed immediately to the hospital and her blood was matched with her husband's. With rest in bed there was no bleeding until three weeks

after entering the hospital, when she began to flow very freely. She had been kept in bed these three weeks for the purpose of getting the baby to viability. No vaginal examinations had been done. The treatment was entirely conservative as the presenting part was high. The diagnosis of some form of placenta previa was made. Examination showed the uterus to be soft and the fetal heart present, she was not in labor. Cesarean section seemed to be the operation of choice, although the prematurity of the baby made its survival problematical.

A low, classical cesarean section was done without bladder reflection, the placenta was found to lie over the cervix. A 6 lb., 14 oz., female child was delivered, but died three hours later. An autopsy showed that no true primary cause of death other than prematurity could be found. Edema of the brain and atelectasis of the lungs pointed to death from asphyxia, which fact was further evidenced by petechial hemorrhages.

Her temperature remained normal, and the convalescence was uneventful. She has since had three children and was sterilized at the birth of the last one.

Comment. The conservative treatment of cases of painless bleeding before viability, if the patient can be hospitalized and if bleeding ceases, is ideal. In such cases, vaginal examination is not justifiable. It jeopardizes the lives of both mother and baby because of the probability of a hemorrhage following the examination which makes immediate delivery absolutely necessary. At operation the placenta was found over the cervix, had she been treated with a bag, much hemorrhage might have ensued, and of course the baby would have had no chance whatever.

MEDICAL ETHICS

DR. CHEEVER. Most people have an idea that the members of the medical profession are governed by a special and peculiar code of ethics, which may be admirable in its intentions but is nevertheless rather idealistic and unpractical, and sometimes makes it difficult for the patient to get exactly the attention which he thinks he ought to have.

MRS. X. It is true, Dr. Cheever, that we laymen hear a good deal about medical ethics and are sometimes rather mystified about it. But surely the conduct of an honorable physician is governed by the same principles as guide other people, isn't it?

DR. CHEEVER. Of course it is, and these principles, as so often has been said, really amount to the Golden Rule.

Doctors are often spoken of as belonging to one of the noblest of the professions, but some of us wince a little at

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

A Green Lights to Health broadcast given by Dr. David Cheever on Wednesday, June 15, 1938, and sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

the term, because we know that we are only a cross-section of humanity, influenced by the same motives, ideals and temptations and beset by the same weaknesses as other people. In truth a profession is noble when it is practiced nobly but it is certainly base when it is practiced ignobly, and the same thing may be said of any other occupation. No doubt, there are those who practice medicine ignobly, but I think we are justified in feeling that a profession which requires such a long and expensive education, which is essentially altruistic in its nature, since its object is to relieve suffering and to restore a handicapped person to health and efficiency, which exacts such industry and hard work from its disciples and yields on the whole a rather small compensation, is one that has some, at least, of the attributes of nobility. Our code says, "A profession has for its prime object the service it can render to humanity, reward or financial gain should be a subordinate consideration. Of course this suggests that a commercial or business occupation has financial gain as its first object, and that service to humanity is less important. No fair-minded man believes that there is any such clean-cut difference, but perhaps this statement represents the idealism which has always actuated the best physicians.

There is certainly a great difference between buying services from a physician and purchasing goods from a merchant, who advertises and displays his wares in the most tempting manner and often does not hesitate to say that they are the best to be had anywhere. The prospective purchaser examines them, samples them, and moves on to the shop next door and repeats the process without creating ill-feeling. It is all in the nature of barter and exchange. He is fairly well protected against being misled, by his own knowledge and judgment of everyday things, and by the opinion of the world at large. When a person purchases services from a doctor, however, conditions are very different. The service is based on the science of medicine, of which the patient knows little or nothing. He cannot judge of the skill of the physical examination, the meaning of laboratory tests, the accuracy of diagnosis or the wisdom of treatment. In most cases, even the final result does not give a basis of judgment, because medicine is not an exact science. Moreover, much of the doctor's work must, for the sake of the patient, be performed in private, and is not subject to the scrutiny of the public at large. For these reasons mutual confidence between physician and patient is absolutely essential, the physician listens to intimate revelations and confessions, which he must hold in trust and not reveal unless required to do so by the laws concerning privileged communications, which differ in different states. Any betrayal of this trust or failure to perform his work conscientiously may mean more harm to the doctor's patients than a similar lapse to the clients of any other profession.

The ideal relation between physician and patient is much more likely to be developed if it is long continued or permanent, as in the case of the family physician or general adviser, who guides the wayfarer among medical and other pitfalls from birth to death. Of course the conditions of modern life, especially the necessary encouragement of specialists, have made such a relation almost impossible except in small communities, but the doctor has a right to expect that once he has undertaken the care of a patient he will not be dismissed unless for a very good cause.

Mrs. X. Now, Dr. Cheever, may I ask you to tell us a little more about this relation between doctor and patient? I heard the other day of a lady who sent for a cer-

tain physician and he refused to come, giving some rather flimsy excuse. Wasn't that contrary to law, or at least very unethical?

DR. CHEEVER. Do you happen to know whether it was an emergency, and whether the lady was a regular or former patient of his?

Mrs. X. No, she was not, and it was not an emergency.

DR. CHEEVER. Well, I am glad you asked the question, for there is much misunderstanding about the matter. There is no law in Massachusetts, and no regulation of the Massachusetts Medical Society, which requires a physician to respond to a call. In the words of the code of the American Medical Association: "A physician is free to choose whom he will serve." But if a real emergency exists and no other doctor is readily available, a physician should feel bound in honor to respond, and would certainly be severely criticized by his fellows if he did not do so. Furthermore, having once accepted a case he ought to feel in honor bound to continue with it until, if he has adequate cause for wishing to be released, he has given due notice to his patient so that another doctor can be secured.

Mrs. X. Another thing—sometimes it seems as though it were almost impossible to get the particular physician whom a person wishes, because medical ethics seem to stand in the way.

DR. CHEEVER. I think I can straighten you out on that very easily. In the first place, there is absolutely nothing in medical ethics to prevent a patient from seeking the services of any physician he chooses. One partial exception to this statement I shall mention later. But the confidential relations between doctor and patient and the folly of swapping horses while crossing a stream make it most unwise for a patient to keep changing physicians, especially during the course of a particular illness. In deed, as I have pointed out, a lifelong allegiance between doctor and patient has very much more than a sentimental value. Moreover, in a given community, it is most important for the general social welfare that the physicians should be on friendly terms with each other, and cooperate without jealousy in the care of the sick. Consequently we doctors feel that as our code states, "a spirit of competition considered honorable in purely business transactions cannot exist among physicians without diminishing their usefulness and lowering the dignity and standing of the profession." This means that a doctor, except in case of an emergency, should never take charge of a person known to be the regular patient of another physician, until the latter has either voluntarily given up the case, or has been dismissed by the patient. All that we doctors try to insist on is that the patient shall notify the doctor that his attendance is no longer desired and assure the new doctor that this has been done. It is wise also for the latter to inform the former that he has been called in. The exception that I spoke of is in the matter of consultations. It is of tremendous importance for the patient that there should be the utmost freedom and willingness on the part of the regular doctor to seek help from another qualified authority, but he can hardly be blamed for hesitating if he knows that he may lose his patient by so doing! For this reason it is considered unethical for a consultant to agree to a patient's request that he take regular charge. If the actual attendant asks him to do so, that is a different matter, but it is the custom of most consultants to refuse, in order absolutely to avoid any jealousy or misunderstanding and to make the regular man the more willing to seek help. Have I made the matter clear?

Mrs. X Yes, I think so Now I am tempted to ask you about fees Why isn't there a regular schedule of prices? Why do doctors often charge a varying amount for the same services to different patients?

DR. CHEEVER Well, that is a long story! In the first place, who can say what medical services are worth? Let us suppose that the doctor is an able and ambitious young man, that he has spent eight or nine years after leaving college (which is not unusual) in his studies, that he has expended and perhaps run into debt for \$10,000 in so doing, and that at an age from thirty to thirty-two he is ready to start in to build up a practice which will be terminated by a worn-out heart at sixty or by forced retirement at sixty to sixty-five, and let us suppose that, by the exercise of his special knowledge he is able to save the life of a wealthy man What are those services worth? At the other end of the scale, suppose he does exactly the same thing for the forgotten man on relief What is that worth? I am sure I don't know, but isn't it clear enough that under our present system the same fee can not be charged to all persons? For time out of mind the best doctors have been glad to give a certain proportion of their time and skill, without fee, to the care of the sick poor, and they hope to be able to continue to do so in the future if they are not interfered with by meddling some government regulation But to be more specific, I think that there should be complete frankness between patient and physician about the matter of fees The patient, if he has any doubts, and before he asks for advice or treatment, should feel free to ask exactly what expense he is about to incur, and I hope he will find that the doctor will be glad to learn whatever he cares to reveal about his financial situation, to plan the treatment and fee accordingly, or to help him, if necessary, get equally good advice and care from some younger but competent man or from some other of the readily available agencies. I might quote our code of ethics on the matter Physicians may place any value they deem proper on their services, with the understanding and consent of their patients beforehand." Does that answer your question?

Mrs. X Yes, and it reminds me of another What is all this talk about fee splitting?

DR. CHEEVER Fee splitting is an abuse which seems to have attracted attention lately, but which must be as old as the profit motive, if not so respectable. It simply means the payment of a commission, usually secretly, by one physician to another, as a reward for calling him in consultation or to perform special services such as a surgical operation. Such a practice cannot fail to lead to scandalous abuse, since it puts the premium on calling the consultant who will pay the highest commission, instead of the one best fitted for the job in hand. No decent doctor would engage in the practice, and any physician who did would be expelled from the Massachusetts Medical Society.

Mrs. X One more question along the same line. What is group practice and contract practice? Are they considered unethical?

DR. CHEEVER You must not confuse these two terms. In group practice a number of physicians who pursue different branches or specialties associate themselves together so that a patient may obtain, within the group, advice and treatment for any phase of his complaint you can see that that may save him time, trouble and perhaps expense. There is nothing unethical about that. Like anything else, it may have drawbacks—for instance, one or more members of the group may not be very competent, and yet the inducement for the patient to consult them may be very great. In general, the relation of the

group to the patient and to society should be exactly the same as that of the individual doctor Now, contract practice means that a doctor agrees to attend a number of individuals or families for a certain length of time for a fixed sum, such an arrangement is not strictly unethical, but it is not encouraged by medical societies, because practice under such conditions tends to be a cut price affair which leads to a poor grade of medical work.

Well, I suppose our time is about up, but you seem to take such a genuine interest in these matters that I wish I could discuss with you some of the many other aspects of medical ethics, for instance, why anything that savors of self-advertisement by the practicing physician is condemned, why he is not supposed to tell the world what a fine doctor he is by writing articles, about what he is doing, in newspapers and magazines or by radio addresses I daresay you can see the point! I'd like to try to explain the attitude of the doctors of the regular school toward the cults—I won't name them for fear of offending some of our radio audience! The physicians of what we may call, for want of a better term, the regular school, base their medical art on science on facts slowly accumulated through the centuries by observation, experience and experimentation They do not care where these facts come from, whether from the research laboratory or from the jungles of Peru, so long as they are able to stand the test of scientific proof. The cults, on the other hand, usually base their method of practice on some exclusive dogma or unproved theory such as that all diseases are caused by displacements of bones. It is no more possible for a doctor to consult advantageously about a patient with a cultist who believes that, than it is for you to discuss geography with a man who still believes that the earth is a flat disk!

Another matter I don't believe it is necessary to remind you that the best physicians will never have anything to do with secret remedies, and if they make a useful discovery they immediately publish it, thus giving it to the world, instead of patenting it and thus reserving it for their exclusive use. That is one of the reasons that medicine is called a liberal profession.

Well, our time is up In thinking over what I have said, I believe you can't fail to see that these principles of conduct which we call medical ethics are really designed to help the public obtain the very best medical service, which after all is the aim of every physician worthy of the name.

MISCELLANY

A SECOND U.S.P. SUPPLEMENT

At the recent meeting of the U.S.P. Board of Trustees, authority was given for the publication of the *Second U.S.P. XI Supplement*. It is hoped that this can be printed and released on January 1, 1939.

Preparation for this supplement has been under way for months, and subcommittee chairmen will be in a position in the near future to submit reports on a number of revised texts. The Subcommittee on Scope is also considering the admission of a number of additional important new drugs.

The members of the committee are fully familiar with the outstanding advantages of the interim revision and supplement features of the pharmacopoeial program. This gives the opportunity to issue new standards after they have been subjected to extensive checking in many laboratories.

The former decennial revision method compelled the consideration of between five and six hundred items simultaneously, and then at the end of the revision period

it became necessary to go to press with the entire lot, irrespective of the status of their revision. Of necessity, with some subcommittee chairmen handling from a hundred to a hundred and seventy five separate monographs, it was impossible to give each article the exacting consideration and extensive review which has been possible under the new plan by which only a dozen or so monographs are under revision at one time.

The supplement is also permitting the prompt recognition by the *Pharmacopoeia* of important new medicines, and, as indicated above, this will be a feature of the *Second Supplement*.

The U.S.P. Board of Trustees modified the original plan for the issuance of annual supplements before the *First Supplement* was issued, on the ground that a more flexible plan seemed necessary. They became convinced that in some years circumstances might make it necessary to issue a new supplement before twelve months had passed, while under other conditions an additional supplement might not be required for several years. The Board therefore announced, through the medical and pharmaceutical press, about a year ago, that new supplements would be issued whenever, in the judgment of the Committee of Revision and the Board of Trustees, conditions made this desirable.

The Board of Trustees and the Committee of Revision are responsible only for the preparation of the official standards. Whether or not the *Pharmacopoeia* and its supplements are purchased by retail pharmacists is, in some states, entirely optional. In other states where the law requires the possession of these books, it is a matter for the responsible state officials to enforce.

Finances are in excellent condition and the Board of Trustees has been able to meet the revision expenses of the decade, to increase greatly the research and conference programs, and still to hold its basic reserves intact.

In preparing the *Second Supplement*, every step will be taken to insure the carrying out of the requirements of the convention for the preparation of an official text. It is expected that the revised or new monographs will be submitted in the form of proof to members of the Committee on Revision and given wide publicity. Following their publication, a public hearing will be granted at which members of the Executive Committee responsible for revised texts will be in attendance. Following the public hearing a conference with the officials of the Food and Drug Administration and the United States Public Health Service will be held, after which the members of the Committee of Revision will be given an opportunity to see and vote upon the approved text. When the *Second U.S.P. XI Supplement* has been issued, ample time will be given before it becomes official.

SCULPTICOLOR OF FILDES'S MASTERPIECE 'THE DOCTOR' GOES TO ROSENWALD MUSEUM

The reproduction of the Sir Luke Fildes's masterpiece "The Doctor," first shown by the Petrolagar Laboratories at Chicago's Century of Progress Exposition in 1933, was recently presented by its owners to the new Rosenwald Museum of Science and Industry in that city.

Following the two world's fairs, "The Doctor" Exhibit went on a tour of 50,000 miles and was viewed by over five million people in eighteen principal cities throughout the country. Designed to remind the public of the importance of the family physician, its completion required the full time of the late Chicago sculptor, John Paulding,



The Doctor

and the noted artist, Rudolph Ingerle, and a large corps of assistants for nearly a year.

In its new location it will be seen by millions of visitors annually.

CORRESPONDENCE

PETTY POLITICS

To the Editor Relative to your comment regarding the City Hospital, are you aware that the Boston City Hospital is specifically chartered for the benefit of the indigent poor of Boston?

Would it not be a great benefit to the overburdened taxpayers of Boston if the City Hospital was cleared of the well-to-do politicians and their well-to-do friends who receive medical treatment in the Hospital proper and also in the Out Patient Department, free?

Does the editor think that city employees, with steady positions, come under the head of the 'indigent poor'?

Mayor Tobin could save plenty by restricting admissions to the Hospital, to those who come under the class of people, for whom the Hospital was chartered.

CHARLES MALONE, M.D.

46 St. John Street,
Jamaica Plain, Massachusetts

* * *

March 21, 1938

Dear Dr. Malone

I have just returned from a short vacation, and your interesting letter of March 5 has been brought to my attention. To the best of my knowledge, the executives of the Boston City Hospital, within the past few years, have made a strenuous and successful effort to eliminate 'free beds' for politicians and their friends and constituents. Furthermore, this point was adequately covered in the editorial "Pettyfogging Petty Politics" which appeared in the February 17 issue of the *Journal*.

ROBERT N. NYE, M.D.

8 Fenway,
Boston

* * *

May 22, 1938

Dear Dr. Nye

The letter I wrote was intended for publication in the *Journal*.

I with three other doctors as a committee from the Norfolk District studied for three months the hospitals in Boston, also I was one of the committee of three from Norfolk, Middlesex South and Suffolk to study the abuses at the hospitals in Boston that I was specially assigned to the City Hospital that I think I know conditions there

very well, that Dr Manary is a good man and not to blame for the rotten abuse of politicians and others who are getting free care there at the expense of the taxpayers.

I have been just wondering what the *Journal* has done to help the doctors in these trying times. One doctor tells me that he has not had a call in three months. An obstetric specialist tells me that he had two cases in 1937, that practically all his patients have gone to the Lying in Hospital.

Conditions seem to be very good for a few men at the top for the men that are in control of the *Journal* but I understand the *Journal* is supported by the general practitioner.

Your excuse for not publishing my letter is poor and not true.

CHARLES MALONE, M D

46 St. John Street,
Jamaica Plain, Massachusetts

* * *

May 24, 1938

Dear Dr Malone

Every resident of the City of Boston and every employee, with the exception of those employed by the Hospital Division, are sent bills if they are cared for at the Boston City Hospital. If the bill is unpaid, the case is investigated by a constable, and if, in the opinion of the latter, the patient cannot afford to pay the bill, the case is considered by the Board of Trustees.

This new regime represents a strenuous and successful effort to eliminate free beds for politicians and their friends and constituents. No doubt certain cases get by, as is bound to happen in any large institution, but the executives of the hospital are making an honest effort to remedy pre-existing conditions.

All this was brought out in the editorial "Pettyfogging Petty Politics," which appeared in the February 17 issue of the *Journal*. In the opinion of the editorial staff your letter of March 5 did not present a statement of fact, and for this reason was not published.

You question in your recent letter as to what the *Journal* has done to help the doctors in these trying times. The main function of any medical journal is the publication of papers which, it is hoped, serve to keep the practitioner informed in regard to modern medicine. The *New England Journal of Medicine* has in addition, published news items, book reviews and editorials. In the latter we have commented on the trend of government (federal, state or local) medicine and have implied that this tendency deserves serious consideration by the subdivisions of the Massachusetts Medical Society. There seems to be little more that we can do until some definite action is recommended. You can be assured that the staff of the *Journal* is of the belief that the general practitioner represents the bulwark of the medical profession, however, it seems likely that many changes will have to be made in medical practice in order that it may conform to the wants and demands of a medically intelligent, socially minded public.

Very truly yours,

ROBERT N NYE, M D

8 Fenway,
Boston.

P S If you are still of the opinion that your original letter should be published, we are willing to do so, but believe that your second letter and my two replies should be published simultaneously.

R N N

* * *

May 31, 1938

Dear Dr Nye

I thank you for the explanation why my letter was not published.

However, I think it would be to the benefit of the profession to publish my letter, and I have no objections to publishing my second letter and your two letters of reply.

CHARLES MALONE, M D

46 St. John Street,
Jamaica Plain, Massachusetts

NEW RULING AT MIDDLESEX UNIVERSITY

To the Editor At a meeting of the Board of Trustees of Middlesex University on June 3, 1938, it was voted that from that date on no graduate of an osteopathic school, even though he has been admitted to medical practice in Massachusetts, will be granted advanced standing in the School of Medicine.

C RUGGLES SMITH, *President*

Middlesex University,
Waltham, Massachusetts

REPORTS OF MEETINGS

ALUMNI LECTURE, TUFTS COLLEGE MEDICAL SCHOOL

The fifth annual Alumni Lecture of the Tufts College Medical School was given at the school April 6. The presiding officer was Dean A. Warren Stearns. The speaker was Dr. George W. Holmes, of Boston, whose subject was "Pulmonary Hemorrhage."

The various conditions giving rise to bleeding from the lung are heart disease, tuberculosis, bronchiectasis, tumor, lung abscess and foreign body. At the Massachusetts General Hospital, cardiac disease is the greatest single cause of pulmonary hemorrhage, while tuberculosis is uncommon.

Every x-ray examination of the chest should be started with a fluoroscopic examination. During fluoroscopy one notices the movements of the diaphragm, the condition of the posterior mediastinum, the pulsations of the heart and great vessels, and changes in the appearance of the lung during inspiration and expiration. This preliminary examination serves to indicate what position the patient should be placed in for the x-ray and during which phase of respiration the picture should be taken. This is very important because each case is a special problem.

A series of lantern slides of x-rays was shown, starting with a normal chest during inspiration and expiration. The slides showed that during expiration one obtains a better view of the apex, that the upper portions of the lung do not deflate so much as the lower portions, and that the transverse diameter of the heart increases. A lateral plate with a barium meal in the esophagus showed that, in the living, this tube does not lie against the spine, rather, it lies close to the heart.

A diagram was shown, dividing the lung into units of bronchial supply. The importance of this feature is that once one establishes the parenchymal location of a lesion it is relatively simple to name the bronchus involved, should the lesion be secondary to bronchial disease.

Plates on a case of pneumothorax were shown. During expiration there is an increase in the size of the pleural air space and in addition there is a shift of the mediastinal structures to the side opposite the pneumothorax.

A series of atypical tuberculous problems was presented. A case of clinical lobar pneumonia with signs of right upper lobe consolidation showed many tubercle

bacilli in the sputum. In a few weeks the x ray showed no abnormal shadows. This case was interpreted as lobar pneumonia associated with ulceration of a bronchus by means of an underlying lymph node. A child was studied because of cough and wheezing. X ray showed an enlarged hilar node. A plate taken during expiration showed no deflation of the lung on that side. This was interpreted as a ball-valve type of obstruction of the bronchus by means of an adjacent tuberculous lymph node.

One case showed cough and pulmonary hemorrhage. Anteroposterior plates showed haziness of the right base. Lateral views showed collapse of the middle lobe. At a subsequent bronchoscopic examination a blood clot was found plugging the main bronchus to the right middle lobe. This was removed and prompt recovery followed.

Pulmonary hemorrhage in children should make one think of foreign body. Frequently an ordinary chest plate shows no abnormality. The foreign body, which is frequently not seen by x ray, may cause a block. Consequently, a plate taken during expiration may show lack of proper deflation of the lung.

The case of an adult who gave a good history of having aspirated a lamb bone, immediately after which he developed a continuous wheeze, was presented. Chest plates taken during inspiration and expiration were negative. A bronchoscopic examination, however, disclosed the foreign body and it was removed. Dr Holmes suggested that a film taken with a Bucky diaphragm might well have shown the bone.

Cases of congenital cystic disease of the lung are often diagnosed as tuberculosis. They have hemoptysis and are often admitted to tuberculosis sanatoriums. Several slides were shown to illustrate this mistake in diagnosis. Another condition frequently diagnosed as tuberculosis is bronchiectasis. With a good history and with lipiodol studies of the bronchi it is relatively easy to establish the correct diagnosis.

Several cases of primary lung carcinoma were discussed. One case with foul sputum was originally considered as a lung abscess, but no etiology for the abscess could be found. X ray studies showed a mass in the middle lobe. In the upper half of the mass was a cavity with a fluid level. This turned out to be a primary lung carcinoma which had become infected, giving rise to an abscess—a not uncommon situation in primary carcinoma of the lung. Another case presented a history of hemoptysis. X ray showed enlarged hilar lymph nodes. During expiration there was deficient deflation of one lower lobe and part of the upper lobe. The diagnosis was primary carcinoma of the lung, considered inoperable because of metastases to the lymph nodes. One case showed a unilateral hilar mass thought to be compatible with enlarged lymph nodes. A lateral view, however, disclosed the area of density to be within the lung itself. The diagnosis of primary lung carcinoma was finally confirmed. One case of collapsed lower lobe was shown, the collapse being on the basis of bronchial obstruction by a primary carcinoma.

Three cases, all with similar histories of upper respiratory infection and bloody sputum, were then presented. All showed x ray signs of collapse of the right middle lobe. In one of the patients, the collapse disappeared by the end of a week. He was not bronchoscoped. Biopsy of the bronchus in the other two cases revealed chronic inflammation with no evidence of tumor.

Several cases of benign tumor of the bronchus were presented. These tumors may give rise to pulmonary hemorrhage, frequently they cause bronchostenosis. Some can

be removed through the bronchoscope while others necessitate lobectomy.

Pulmonary embolism is liable to give no x ray signs unless it is complicated by pulmonary infarction. With improved x ray technic many more small postoperative infarcts are found which were previously unsuspected. Massive collapse of the lung is less common now than in the past. It frequently occurred during the Great War. It may be prevented in many instances by encouraging the patient to change his position from time to time.

Lesions other than pulmonary which may cause bleeding simulating pulmonary hemorrhage are tracheal adenomas and ruptured esophageal varices. X-rays of a typical case of each of these conditions were shown by Dr Holmes.

WILLIAM HARVEY SOCIETY

The final meeting of the William Harvey Society of the Tufts College Medical School for the current academic year was held at the Beth Israel Hospital Friday evening, May 13, Dr David D Berlin presiding. Dr Frank H. Lahey delivered the paper of the evening on the subject "Thyroid Surgery and Thyroid Disease and Some of the Newer Developments."

Dr Lahey believes that there are two types of hyperthyroid disease: (1) the so-called "activated type" and (2) the "apathetic type." The first group consists of characteristically young individuals who show great hyperactivity, marked tachycardia, enlargement of the thyroid gland, exophthalmos, and the so-called "frozen fright" facies. They usually have markedly elevated basal metabolic rates. The patient suffering from 'apathetic hyperthyroidism' is usually an elderly woman. The thyroid gland is not enlarged, there is only moderate tachycardia, and the patient appears quite calm in contrast to the extreme activity and 'frozen fright' of the activated group. The basal metabolic rate is only moderately elevated, ranging between +18 and +25 per cent in the usual case. Such cases show very striking benefit from thyroidectomy.

Hyperthyroid patients with associated cardiac decompensation but no underlying organic heart disease are classified in the 'thyrocardiac' group by Dr Lahey. He does not believe that thyroid disease in itself will produce organic heart disease. The decompensation observed in these patients is attributable to the extreme degree of cardiac activity provoked by the increased body metabolism. Operative procedures on the thyroid in such individuals usually bring about cardiac compensation which is maintained permanently after the operation. These cases are given digitalis before operation, and are treated with quinidine on the third or fourth postoperative day. Any patient with a cardiac reserve of such a degree as to enable him to tolerate subtotal thyroidectomy is practically certain to recover compensation postoperatively.

Exophthalmos is one of the most distressing complications of thyroid disease. It occurs not only in hyperthyroidism but also in myxedema. Indeed some of the most intractable instances of exophthalmos are encountered in the latter disease. In severe and progressive cases of exophthalmos Dr Lahey advises suturing the eyelids together to prevent extreme and irreversible eye changes while preparations for more permanent procedures are made. Attempts to treat exophthalmos by resection of the superior cervical sympathetic ganglia have not been successful, although this procedure does allow the lids to come closer together. The Naffziger operation in which the orbit is decompressed by removing the lateral and superior orbital walls is the most successful method of remedying severe exophthalmos. This procedure allows

expansion of the orbital tissues and muscles without protrusion of the eyeball

Dr Lahey has been impressed by the frequency of hepatic dysfunction in patients suffering from hyperthyroidism. Individuals in thyroid storm and with hyperthermia not infrequently develop jaundice. Estimation of liver function by the hippuric acid clearance test has indicated marked reduction of liver function in patients with markedly elevated basal metabolic rates. When the metabolic rate was decreased by administration of iodine the liver function improved, and after cure of hyperthyroidism by subtotal thyroidectomy the hippuric acid excretion returned to normal, indicating normal hepatic function. An accurate correlation was noted between the return of the basal metabolic rate to normal, and the return of the hippuric acid excretion to normal.

The proteogenic function of the liver is also impaired in hyperthyroidism, and there is a tendency toward lowered serum proteins in hyperthyroid individuals.

Attempts to show an increase in circulating thyroxin in hyperthyroidism have been unsuccessful, and led to determinations of the levels of blood iodine in various thyroid diseases. In hyperthyroidism there is only a small amount of iodine in the thyroid gland itself, while there is an increase in the amount of iodine in the blood. It is believed that the hyperactive thyroid gland of hyperthyroidism releases its thyroxin into the blood stream as soon as it is formed, instead of storing it in the form of colloid. This is reflected by the increase in total blood iodine. Following subtotal thyroidectomy there is a decrease of the blood iodine which returns to normal with cure. If there is recurrence of hyperthyroidism, however, there is again a rise in blood iodine. Investigations into the physiology of thyroid iodine at the Lahey Clinic have tended to clarify the above relations. Some 70 per cent of hyperthyroid patients were found to have an elevated blood iodine, the remaining 30 per cent had blood iodine levels which were normal or below normal. The levels of both groups returned to normal six months after cure by subtotal thyroidectomy. It was noted that the percentage of recurrent hyperthyroidism in patients with high blood iodine levels was very low, whereas it was 22 per cent in those individuals with normal or low levels. Those patients with low blood iodine levels suffered from a more severe form of hyperthyroidism as was indicated by the fact that 45.5 per cent of this group had to have thyroidectomy performed in several stages, while only 17 per cent of the high blood iodine group had to have stage operations. These facts are explained by the observation that patients with low blood iodine have had hyperthyroidism for a year or more and the low level is merely a reflection of the general depletion of the body's iodine. Such individuals must be treated more conservatively than those with a high blood iodine.

The blood cholesterol is an indication of the metabolic level. It is found to be decreased in hyperthyroid patients, the level varying inversely with the severity of the disease. It is elevated in myxedema, and also in chronic thyroiditis. The blood cholesterol level is actually a more sensitive indicator of thyroid activity than is the basal metabolic rate, although it cannot be used as a clinical indicator of thyroid disease because of the small range between the low normal level and the values encountered in hyperthyroidism.

Dr Lahey advised operative removal of practically all thyroid adenomas because of the fact that almost all thyroid carcinomas arise in previously existing adenomas.

In surgery of the thyroid gland it is important to

identify and make certain that the recurrent laryngeal nerves are not injured. Since adopting this principle the incidence of laryngeal palsy at the Lahey Clinic has been reduced from 1.3 per cent to 0.3 per cent. In the event that the recurrent laryngeal nerve is cut, it is important that it be resutured within three months if any degree of function is to be restored.

Of some 18,000 thyroid operations performed at the Lahey Clinic the mortality from all causes is only 0.76 per cent. Of these 115 deaths, 62 per cent were due to postoperative complications such as pulmonary embolism, heart failure, and thyroid storm. The mortality from hyperthyroid disease is much lower in Massachusetts than it is in New York and Pennsylvania, a fact which Dr Lahey attributes to the custom in Massachusetts of performing operations on the thyroid much earlier in the course of the disease.

A very interesting colored motion picture was shown which illustrated the technic of subtotal thyroidectomy.

NEW ENGLAND OTOLOGICAL AND LARYNGOLOGICAL SOCIETY

A meeting of the New England Otolological and Laryngological Society was held at the Massachusetts Eye and Ear Infirmary, Boston, on November 16, 1937, Dr Frederick T. Hill presiding. The following papers were read:

STREPTOCOCCUS MENINGITIS Dr F. B. Sargent, Providence, Rhode Island.

Four cases of acute suppurative otitis media were reported. One was complicated by meningitis and two had blood cultures that were positive for *Streptococcus hemolyticus*. All were treated with sulfanilamide and recovered.

Two of the cases which came to mastoidectomy showed that, whereas the sulfanilamide brought about prompt improvement in the patients' general condition, it did not inhibit bone destruction.

OTOLARYNGOLOGY IN THE MIDWEST: A COMPARISON OF METHODS Dr E. G. Boss, Springfield, Massachusetts

During the past several years the author spent a considerable amount of time in some of the large Midwestern clinics and thus had ample opportunity to compare the practice of otolaryngology in that region with that in New England. The following are some of his observations:

By far the greater number of tonsillectomies are performed by the general practitioners. In the James Whitcomb Riley Hospital, of Indianapolis, peritonsillar abscesses are usually opened under ether anesthesia. It appears that many Midwestern otolaryngologists perform a considerable amount of head and neck surgery which, for the most part, is pre-empted in New England by the general surgeon. In the author's opinion this state of affairs is due to the influence of Dr Barnhill. Zinc ionization for the treatment of vasomotor rhinitis has largely been supplanted by the topical application of 0.5 per cent phenol in olive oil, on the middle and inferior turbinates. Ossiculectomy is being almost totally ignored. In the Midwest, to use the author's own words, the otolaryngologist has won the argument as to whether the Mosher-Tott operation belongs to him or to the ophthalmologist. Several instruments which were invented by Midwestern otolaryngologists were shown

TWO CASES OF ANEMIA FOLLOWING THE ADMINISTRATION OF SULFANILAMIDE. Dr W E Kershner, Bath, Maine.

Two cases of hemolytic streptococcal mastoiditis treated with sulfanilamide were reported. They were of like severity and occurred in otherwise healthy individuals. During the administration of the drug both cases developed anemia, the red-blood-cell count dropping to 3,300,000 and 2,900,000 respectively. In both patients the blood picture returned to normal after the drug had been discontinued.

LUNG ABSCESSSES AT THE BOSTON CITY HOSPITAL. Dr L. M. Freedman, Boston

The author made an exhaustive study of all lung-abscess cases observed at the Boston City Hospital during the ten year period from 1926 to 1936. There were 276 proved cases. Two hundred of these were of medical origin, the remaining 76 occurred as postoperative complications. Of these latter only 16 followed tonsillectomy. In comparing the numbers of the various operations it was found that the ratio of lung-abscess cases to the total number of tonsillectomies was 1/1654, whereas in dental cases it was 1/320, and after gastric operations 1/54. All tonsillectomies were performed in the upright position. Inasmuch as only 1 lung abscess occurred in 1654 tonsillectomies, the author feels that position is of no importance as an etiologic factor. The preoperative condition of the patient is of great importance. The author is convinced that the most potent cause of pulmonary complications is the infection present in the upper or lower respiratory tract before operation. A rather dramatic case was cited: a patient was not passed for tonsillectomy on account of a lower respiratory infection, he developed a lung-abscess which would have been laid at the door of the tonsillectomy had it been performed.

This paper has since appeared in full in the *New England Journal of Medicine* (218 663-668, 1938)

INNER EAR DEAFNESS OF UNUSUAL ETIOLOGY. Dr P B MacCreedy, New Haven, Connecticut.

A case of inner-ear deafness which occurred following the injection of a prophylactic dose of tetanus antitoxin was reported. The case was unique inasmuch as the two other cases which have been reported in the literature followed massive doses for the treatment of tetanus.

USE OF TUNING FORKS. Dr W Mueller, Boston

A brief demonstration of the various types of tuning forks was given, with special reference to such forks as are usually found in the otologist's office. Inasmuch as the audiometer is not as yet the ideal instrument for audiometry, a plea was made for the proper appreciation and use of the tuning fork. The manner of striking and holding the various forks is important. Forks used for the Rinne test should be standardized on a goodly number of subjects with supposedly normal hearing. If the standard for bone and air conduction of such a fork is kept in mind, much can be learned from the Rinne test as regards the type and severity of the patient's deafness, and, incidentally, the Schwabach test is rendered unnecessary.

ATROPHIC RHINITIS. THE CONSTITUTIONAL FACTOR AND THE TREATMENT WITH ESTROGENIC HORMONES. Drs H. Mortimer, R. P. Wright and J B Collip, Montreal, Canada.

This paper appeared in full in the *Canadian Medical Association Journal* (37 445-456, 1937). The following is the authors' summary

1 Study of the cranial skiagrams of 68 cases of atrophic rhinitis and ozaena gave evidence, in a large majority, of a dyspituitary state during or subsequent to the growth period.

2 It is suggested that the disease occurs as a genetically transmitted, more or less localized, focus in a special familial constitution, produced by the mating of dyspituitary individuals, in whom anterior lobe function is unstable in secretory activity, nature or time of activity. It is on this basis that the nasal osseous changes are to be understood.

3 Speculation as to the mode by which a dyspituitary constitution might influence the morphologically specialized conchal mucosa led to the investigation of the nasogenital relationship in the monkey, and recognition of the fact that administration of oestrogenic substance produces a specific response in the conchal mucosa, closely akin to that resulting in other 'sex skin' areas, as already reported.

4 That such specific changes are of an order opposed to the pathological changes occurring in atrophic rhinitis justified the exhibition of dihydroxy-oestrin locally to the nose in this disease.

5 Thirty-one female and 7 male patients were available and treated, with results justifying the conclusion that in oestrogenic hormone insufflation there is to be found a therapy for ozaena and atrophic rhinitis considerably more effective than any other till now available.

6 Seven patients were found suffering from both atrophic rhinitis and progressive deafness, an eighth case showed both otosclerosis and hypertrophic rhinitis.

NOTICES

UNITED STATES CIVIL SERVICE EXAMINATIONS

Medical Officer, \$3,800 a Year
Associate Medical Officer, \$3,200 a Year

Applications must be on file with the United States Civil Service Commission at Washington, D. C., not later than July 18.

Applicants, in order to become eligible, must qualify in at least one of the following optional branches, and must state in their applications the branch, or branches, desired: (1) cardiology, (2) dermatology, (3) eye, ear, nose and throat (singly or combined), (4) industrial medicine, gas analysis or toxic dust, general, (5) internal medicine and diagnosis, (6) medical pharmacology, (7) pathology and bacteriology, (8) public health general, venereal disease, (9) roentgenology, (10) surgery general, orthopedics.

Medical-officer applicants must have had 1 year of internship, general rotating or in a special branch, and 3 years of experience in the practice of medicine.

Associate medical-officer applicants must have had 1 year of internship in the optional branch claimed, privately or in some recognized hospital.

The necessary forms may be obtained from the Secretary, Board of United States Civil Service Examiners, at any first-class post office, or from the United States Civil Service Commission, Washington, D. C.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JULY 4

THURSDAY JULY 5

*10 a. m. 12.30 p. m. Tumor clinic Boston Dispensary

FRIDAY JULY 6

10 a. m. 12.30 p. m. Tumor clinic Boston Dispensary

SATURDAY JULY 9

10 a. m. 12 m. Staff rounds at the Peter Bent Brigham Hospital
Conducted by Dr. Robert T. Monroe

Open to the medical profession

SEPTEMBER 12 14—American Association for the Study of Goiter Page 545
issue of March 24

SEPTEMBER 12 15—American Congress of Physical Therapy Page 946
issue of June 2.

OCTOBER 8 and NOVEMBER 15—American Board of Ophthalmology Page 82
issue of February 10

OCTOBER 17 21—Clinical Congress of the American College of Surgeons
New York City

OCTOBER 24 26—Academy of Physical Medicine Scientific Session Wash-
ington D. C.

DISTRICT MEDICAL SOCIETIES

HAMPDEN

Meeting will be held on the fourth Tuesday in July

PLYMOUTH

Meeting will be held at 11 a. m. on July 21

BOOKS RECEIVED FOR REVIEW

Quelques Vérités Premières (Ou Soi Disant Telles) sur les Maladies des Enfants Robert Debré. 93 pp. Paris Masson et Cie, 1938. 28 Fr. fr.

L'Année Thérapeutique Médications et Procédés Nouveaux A. Ravina. 203 pp. Paris Masson et Cie, 1938. 25 Fr. fr.

A Synopsis of the Diagnosis of the Acute Surgical Diseases of the Abdomen John A. Hardy. 345 pp. St. Louis The C. V. Mosby Company, 1938. \$4.50

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1937 201 pp. Chicago American Medical Association, 1938. \$1.00

New and Nonofficial Remedies, 1938 Containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1 1938. 589 pp. Chicago American Medical Association, 1938. \$1.50

The Life of Chevalier Jackson An autobiography. 229 pp. New York The Macmillan Company, 1938. \$3.50

The Relationship Between Characteristics of Personality and Physique in Adolescents P. S. de Q. Cabot. 120 pp. Provincetown The Journal Press, 1938. \$1.50

Industrial Surgery Principles problems and practice Willis W. Lasher. 452 pp. New York Paul B. Hoeber, Inc., 1938. \$6.00

Intoxications et Carences Alimentaires Maurice Loeper. 259 pp. Paris Masson et Cie, 1938. 60 Fr. fr.

BOOK REVIEWS

Annual Reprint of the Reports on Pharmacy and Chemistry of the American Medical Association for 1937 201 pp. Chicago American Medical Association, 1938. \$1.00

This book is a great deal more than a mere record of the negative actions of the Council on Pharmacy and Chemistry of the American Medical Association. It gives

in full the reasons for the council's rejection of various preparations, but it also records results of investigations of new medicinal agents not yet out of the experimental stage, and frequently contains reports on general questions concerned with the advance of rational drug therapy. All three categories of reports are represented in the present volume.

This issue of the reports is remarkable for the series of valuable status and preliminary reports published by the council in the past year. These include the reports on Avertin with Amylene Hydrate (now accepted), Benzidine Sulfate (the active constituent of the notorious "pep" pills but a promising drug when its limitations are recognized), catgut sutures (a survey of the sterility of the market supply), Evipal Soluble (a comprehensive review of the evidence for the usefulness and limitations of the drug), histidine hydrochloride (a study of the usefulness of the drug in peptic ulcer, to be considered in connection with the report rejecting Larostidin, a proprietary brand for unwarranted and exaggerated claims), mandelic acid (an authoritative statement of the limitations of this drug which the council has now accepted) and Vinethene (a careful study of the evidence for the drug, which the council has accepted for one year as an anesthetic to be used in short procedures).

Other notable reports of outright rejection of products are those on Causalin (an unsafe and dangerous preparation proposed for use in arthritis), Glutamic Acid Hydrochloride—Calco (proposed as a conveyor of hydrochloric acid, with unsubstantiated claims of clinical effectiveness) and Larodon 'Roche' (proposed as a substitute for other well-established analgesic and antipyretic drugs and marketed with exaggerated and unwarranted claims).

Two reports on sulfanilamide appear,—a nomenclature and status report,—together with reprints of editorials that appeared in the *Journal of the American Medical Association* and that gave warnings which, if obeyed, would have avoided the series of deaths which resulted from the marketing of the ill-fated Elixir of Sulfanilamide—Massengill.

At the end of this volume appears a eulogy of George Henry Simmons, whose death deprived the Council on Pharmacy and Chemistry of its founder and American medicine of a worthy and faithful servant.

Wheeler and Jack's Handbook of Medicine Revised by John Henderson. Tenth edition. 703 pp. Baltimore William Wood & Co., 1937. \$4.00

The editor, John Henderson, of Glasgow, emphasizes that this work is only a handbook and not a textbook of medicine. It covers the field fairly comprehensively, is simple and concise in style, and brings out highlights. This accounts, very likely, for its popularity, being a tenth edition and the sixteenth printing. However, on glimpsing through its pages, one misses some of the advances in medicine that have been made during the past few years.

The Hospital Head Nurse Her Functions and her Preparation Mary Marvin Wayland. Edited by Isabel M. Stewart. 388 pp. New York The Macmillan Company, 1938. \$3.50

The writer of this book is a registered nurse who has occupied several important teaching positions, has been honored with an A.M. degree, and is the wife of a physician. She sets forth the duties and responsibilities of the head nurse of a well-equipped hospital.

Beginning with a brief history of the evolution of the art and science of the nursing profession she proceeds to

define the functions of a modern hospital and the position of the nursing profession in the administration of such institutions. It is made clear that the head nurse should be a well-educated and trained official with accurate knowledge of the duties of all departments of the hospital and with an ambition to bring the nursing service into sympathetic and co-ordinate relation with the medical profession and all other agencies designed to promote success in dealing with the problems of illness.

The training of nurses according to the ideals of the author presupposes that only women of good natural ability and preprofessional education will be able to meet the exacting curriculum of the ideal training school for nurses. When graduated, such nurses ought to be eligible for important positions in the nursing field.

All allied interests designed to qualify graduates for hospital appointments are also set forth.

Doctors, nurses and hospital administrators will find this book interesting and instructive. It is well written and the bibliography is voluminous.

Modern Dietary Treatment Margery Abrahams and Elsie M. Widdowson 328 pp. Baltimore: William Wood & Company, 1937. \$3.25

The problems pertaining to nutrition were, until comparatively recently, very largely considered from an empirical standpoint but, with scientific studies of calories, vitamins and basal metabolism, the needs of the human body are now being dealt with more satisfactorily than formerly, because the biochemist and pathologist have taught the underlying facts relating to malnutrition and the effects of many disease processes.

Among the many books now available relating to nutrition, this one, by the dietitian to Bartholomew's Hospital and the biochemist to Kings College Hospital, sets forth the important known facts clearly and concisely, with a wide variety of food lists which are applicable to the conditions which require specific dietary treatments.

This small volume is well written in orderly fashion and will be useful for physicians and nurses and may be put into the hands of intelligent laymen with safety after the doctor has told the patient the nature of his trouble.

A Biological Approach to the Problem of Abnormal Behavior Milton Harrington 459 pp. Lancaster: The Science Press, 1938

In a previous book (*Wish Hunting in the Unconscious*) Dr. Harrington critically studied psychoanalysis but did not formulate his own approach to the problem of abnormal behavior. In this book he goes on to develop the biologic mechanistic basis of abnormal human behavior. On the whole it may be stated that Dr. Harrington is better as a critic than as an original thinker, although his book is valuable and provocative.

First, as to the defects of the book. The book suffers from the underlying philosophy of the writer, which is to the effect that unconsciousness is an epiphenomenon and has no real relation to the activity and conduct of the human being, thus accepting the position of Thomas Henry Huxley. This philosophic approach is merely one of despair. It is difficult to handle consciousness. It cannot be measured easily. It is something measurable only in terms of itself. It is the sum total of sensory and kinesthetic awareness, — whatever that may mean, — and yet it does not fit into the ordinary schemes of causation and is not easily measured. But it cannot be thrown out because of our lack of understanding or our logical difficulties. By discarding it, one finally is reduced to the

absurdity, which has long since been pointed out, of postulating an unconscious Shakespeare writing his great plays for an unconscious audience and performed by an unconscious set of acts, and thus without impairing the realities of a glorious situation. Moreover, after Dr. Harrington has laboriously kicked out consciousness via the front door, he finally has to readmit it in his discussion, which is mainly as if he accepted consciousness as the real value of life. In his discussion of unconscious thinking, he very directly states that consciousness is the basis of mind and that there can be no such term as unconscious mind, 'which seems to give away his central position. Thus, consciousness slips in again by the rear door.

The reviewer also believes that Dr. Harrington is too much swayed by what he calls the law of parsimony in science. As a matter of fact, there is no such law. It is merely a convenience to establish as few causes as possible. In actuality there is no one cause to anything. There are a flood of variables which have to be considered, and the more variables included, the greater the structure of results. What he uses as a guiding principle has been discarded in the practical workings of science long ago.

So much for criticism. On the whole, the book emphasizes that pleasure and pain, and satisfaction and dissatisfaction, which in turn are created by the constitution of the individual, by the stimuli which flow in on him, and by the standards which have been set up in him by the social milieu in which he finds himself willy nilly, are the leading factors in the production and understanding of abnormal behavior. The emphasis on the biochemical mechanistic background is necessary at the present time. The adherence to things which are provable rather than those which are built up by metaphor, symbol and adroitness is especially important at this period of psychiatry and psychology.

Dr. Harrington builds up a dynamicism of conduct. The steps are discernible without recourse to too dubious inference. One valuable phase of his book lies in the consideration he has given to the absurdity of social requirement, so that an individual may be plunged into difficulties, not so much through his own defects as through the abnormal and impossible demands of society. The author emphasizes the fact that unsatisfactory relations breed a chain of events which finally leads to crime and neuroses, as well as to the minor deviations from satisfactory and satisfying human conduct.

The book suffers from the defect that the author is too much occupied with the desire to contradict and displace the Freudian doctrines. Its value lies in the fact that the onesidedness of psychoanalysis and the other allied approaches to human conduct need to be corrected — certainly so far as present-day psychiatry goes — by the vigorous demonstration that man and all his products are biologic, that biochemistry, electric currents and pharmacological experimentation — to cite only a few of the scientific approaches — can explain and also modify human conduct.

Digestive Tract Pain: Diagnosis and treatment experimental observations Chester M. Jones 152 pp. New York: The Macmillan Company, 1938. \$2.50

This book is an interesting and valuable contribution to the study of digestive tract pain, particularly the localization of pain and its character at different levels in the digestive tube. Experimental study is based on a method used by other investigators, namely the introduction of a distensible balloon into various levels of the digestive tube and the production of symptoms through distention

of these local segments by introduction of air into the balloon. The record of experimental observations is followed by protocols demonstrating the clinical application of the facts observed to the diagnosis of pain at various levels of the digestive tube. A chapter on gastrointestinal pain in functional disease emphasizes the importance of recognizing this type of disorder in differential diagnosis, and its treatment by medical routine and psychotherapy. The final chapter summarizes the sources of digestive tract pain and contains a discussion of therapeutic measures, emphasizing particularly a point in which internists welcome emphasis, namely the value of rest and relaxation in all digestive-tract diseases except the obviously surgical ones.

Of practical interest to the clinician is the corroboration by further experimental data of the following facts, already well established clinically: (1) A disturbance in the neuromuscular mechanism of the digestive tract, producing pain, can be localized when produced both experimentally and by disease, and the localization and character of both types (experimental and pathologic) correspond very closely. (2) The common symptom of heartburn is caused by abnormal neuromuscular activity at the cardiac end of the esophagus, and is independent of the chemical character of the gastric secretion. Internists have recognized this fact clinically because the symptom occurs in patients with normal and with both extremes of abnormal gastric acidity, and because it is so often associated with the habit of belching and with other abnormal gastric neuromuscular activity, such as pylorospasm. (3) Constitutional or neighborhood disease must be recognized as a cause of gastrointestinal pain and digestive symptoms—a fact already well established in the minds of experienced internists. And as a corollary, the importance of backache is discussed as a symptom of gastrointestinal disease such as ulcer or spasm due to gall-bladder disease or to functional disturbances.

The author has successfully presented a concise and precise study of the mechanism of referred gastrointestinal pain, to which he has attached an interesting correlation of diagnostic and therapeutic data from his clinical experience. In its entirety, this book gives further evidence of the fact that in the study of digestive diseases, a careful history, properly evaluated, is an essential part of the diagnostic data.

New and Nonofficial Remedies—1938 Containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1 1938. 589 pp. Chicago: American Medical Association, 1938. \$1.50.

In this book the Council on Pharmacy and Chemistry lists and describes the medicinal preparations that it has found acceptable for general use by the medical profession. A glance at the list of the council members and the long list of consultants appearing in the first part of the book gives ample warrant for the authority of the council's selections.

New substances described in this volume are sulfanilamide and protamine zinc insulin, with the accepted brands. The proved value of these new additions to the physician's armamentarium bids fair to make the past year a milestone in therapeutic progress. The council is to be congratulated on the promptness with which it evaluated these drugs and established standards for their adequate control. From the first the council warned against using sulfanilamide in untried combinations. The sad tragedy of the deaths from the rashly introduced

Elixir of Sulfanilamide—Massengill, starkly emphasizes the value of such a body as the council to the medical profession and the pharmaceutical manufacturers, as well as to the public. Of course this potential value cannot become effective so long as those concerned refuse to follow the recommendations of the council regarding the use of new remedies.

Other noteworthy new drugs which appear in *New and Nonofficial Remedies—1938* are Avertin with Amylene Hydrate, Vinethene and Pontocaine Hydrochloride, basal, general and local anesthetics respectively, Novatropine and Syntropan, synthetic mydriatics.

Physicians who wish to know why a given proprietary is not described in *New and Nonofficial Remedies* will find the "Bibliographical Index to Proprietary and Unofficial Articles Not Included in N.N.R." of much value. In this section (in the back of the book) are given references to published articles dealing with preparations that have not been accepted. These include references to the reports of the council, to reports of the American Medical Association Chemical Laboratory and to articles that have appeared in the *Journal of the American Medical Association*.

Physiological and Clinical Chemistry, William A. Pearson and Joseph S. Hepburn. Second edition. 467 pp. Philadelphia: Lea & Febiger, 1938. \$5.50.

The second edition of *Physiological and Clinical Chemistry* is replete with information and contains much out-of-the-way material. However, certain difficulties will be encountered in using the book as a textbook of clinical chemistry because the material presented is of a mixed quality, being either too sketchy or too involved. For example, the student may be misled in the section on vitamins and hormones by the simplicity of certain sweeping statements and by intricate descriptions of rather unimportant isolated facts. The book lacks bibliography so that one is lost as to where to go in a further search for material to expand the information. The text is characterized by certain technical descriptions which appear to be gleaned from other sources and by somewhat hazy explanations of underlying principles. One can overlook such errors of spelling as those of names like Tisdall. Possibly future editions will rectify such mistakes. The section on blood analysis is somewhat impractical and labored, without being up to date. The book is recommended only to those who may wish to find some out-of-the-way material.

Men Past Forty, A. F. Niemoeller. 154 pp. New York: Harvest House, 1938. \$2.00.

This book aims to give the layman a reasonably thorough understanding of the nature of sexual impotence and its treatment. The author seems not to be a physician but has a good knowledge of physiology as related to the subject in question. His lack of medical training probably accounts for a few rather startling statements such as the assertion that coitus reservatus, if practiced over long periods, leads to "the inflammation and stricture of the urethra, the inflammation and stricture of the prostate gland etc."

The acceptance of certain preparations such as the extract of fresh testicle, also shows an absence of scientific judgment. The author's discussion of rejuvenation by means of Voronoff's and Steinach's operations is very superficial; it might well be misleading. The discussion of the psychic phases of impotence, on the other hand, is better than one usually finds in books on this subject.

Men Past Forty will probably prove to be both interesting and helpful to the not too-critical lay reader. It is essentially sound, and if the reader is not driven off by the rather affected style in which it is written, he should be well repaid for the time spent.

Pavlov and His School The theory of conditioned reflexes
Y P Frolov 291 pp New York Oxford University Press, 1937 \$4.00

This is the most interesting and easily readable life of Pavlov that has been published. It gives, moreover, his final opinions in regard to the conditioned reflex, with which his name will always be associated in the history of physiology. There is considerable material, moreover, about Pavlov's immediate predecessors, facts which are not easily available in English. As a well written life of the author, and especially as a considered evaluation of his work, this book should receive the highest recommendation. The translation is finely done and there are numerous illustrations.

Illness Its story and some common symptoms, a guide for the layman S Henning Belfrage. 173 pp New York Oxford University Press, 1938 \$1.50

This small book is a guide for the layman with respect to illness and presents, in nontechnical language, arguments for the early recognition of departure from normal conditions of the human body. The common symptoms associated with functional disorders and organic diseases are explained, with advice to consult the doctor early and not depend on home remedies. There is no discussion of controversial theories or matters beyond the grasp of people of ordinary intelligence.

It is a book which the doctor may properly advise his patients to read because it would stimulate more interest in the prevention and cure of disease.

Les Explorations Fonctionnelles Noël Fiessinger 430 pp Paris Masson & Cie, 1937 70 Fr fr

This book brings together in a critical and orderly manner a large variety of functional tests applicable both in the clinic and in the laboratory. The author is careful to announce in the introduction that the tremendous number of laboratory procedures available, while aiming to increase the scope of our understanding of various disorders and to assist in guiding the application of many therapeutic procedures, do not totally supplant careful clinical observations. The book contains chapters dealing with procedures designed to evaluate the various functions of the stomach, the pancreas (both exocrine and endocrine), the intestines, the liver and bile passages, the kidneys, the spleen and reticuloendothelial system, the hematopoietic organs, the endocrine glands, the respiratory apparatus, and the cardiovascular and nervous systems. The author has previously published eight more or less extensive monographs, of which four have dealt with the pathologic physiology of the liver. It is not surprising, therefore, that almost a third of the present volume is devoted to the liver and biliary tract. Many of the tests described will be quite unfamiliar to American readers, but most of the ones better known to us are also included. The sections dealing with the cardiovascular, the respiratory and the nervous systems receive rather scant treatment, and those concerning hematology will seem quite old fashioned to American readers.

The table of contents is very carefully and logically arranged but the only index available is one of authors. Unfortunately, although some 600 authors are listed and

some are referred to as many as fifteen or twenty times in the text, there is no bibliography included. Like French works, this one refers predominantly to French writers although the work of a large number of American workers is mentioned.

Synopsis of Genitourinary Diseases Austin I. Dow Second edition 294 pp St. Louis The C. V. Mosby Company, 1937 \$3.00

The reviewer was so pleased with this little book he cannot praise it too highly. Its conciseness and brevity are refreshing in comparison to the monumental thousand page tomes which are so common, yet it covers the fully and well merits its title. The fundamental genitourinary diseases and the principles of their diagnosis and treatment are presented very clearly and completely with numerous illustrations and definite practical suggestions.

There is nothing in the book describing the technique of cystoscopy or of any operations. The reviewer might have realized that there is no room for them in a synopsis, and believes that a companion book by the author on the technique of cystoscopy and of operation on the genitourinary tract would be welcome. Although the reviewer did not agree completely with the author on some minor aspects, he highly recommends this clear synopsis to the medical student, the practitioner of medicine and even to the trained urologist.

Surgical Diseases of the Mouth and Jaws Earl C. Padgett 807 pp Philadelphia and London W. B. Saunders Company, 1938 \$10.00

The author has designed a comprehensive volume of the surgical conditions of the mouth and jaws. The book brings up to date the extensive material on this subject. The problems of maxillofacial surgery are such that they create a common ground for the dental and medical professions, and this ground is well covered by Dr. Padgett for both the student and the expert. Classifications are well carried out with the avoidance of overlapping in coverage of various topics. The author has complied with the requirements of the Curriculum Committee of the American Association of Dental Schools.

Considered in detail we discover a pertinent bibliography at the end of each chapter. In the first few chapters the traumatic injuries of the face and jaw are described. Soft-tissue injuries and facial bone fractures are discussed with illustrations of the specialized splints necessary in the management of these cases. In the second group of chapters is found a discussion of the inflammatory diseases of the face and jaws. The congenital deformities, including cleft palate and harelip, are considered in the third group of chapters. Benign and malignant tumors are outlined next, and in the final portion of the book the surgical techniques necessary to carry out special operations are presented along with a discussion of essential prosthetic restorations.

It is unavoidable in this kind of book to afford as complete coverage of some topics as others, since the author's special interests must be reflected to some extent in the output. The reviewer found special values in the chapters on harelip and cleft palate and in the section on malignant tumors.

In summary, this is a valuable textbook for the student and a useful reference book for the surgeon. The illustrations, of which there are three hundred and thirty-four, are especially well chosen and helpful.

